LINGUISTIC LANDSCAPES (PHYSICAL AND VIRTUAL) OF EMERGENT BILINGUAL 4 TO 6-YEAR-OLDS IN AOTEAROA NEW ZEALAND

by

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The material presented in this thesis is the original work of the candidate and does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma at this or any other university. The University of Canterbury Educational Research Human Ethics Committee (ERHEC) policy statement (ERHEC, 2018) states, “The purpose of research is to produce evolving understanding and information which may improve the situation of human beings” (p. 1). This study was conducted in accordance with ethical norms and was subject to ethical appraisal and approval of both its means and ends.

The ethical application for this study accounted for the ERHEC policy principles and the University of Canterbury Educational Research Human Ethics Committee (Reference number 2016/21/ERHEC) granted ethical approval.

Leona Harris

The world is a vast family,

and humans are children of the earth and sky,

and cousins to all living things.

Such unity means that nature is the ultimate teacher about life.

(Royal, Te Ahukaramū Charles, 2010, p. 9)

To my family, mi familia and whānau

(Especially my Mum and Dad)

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Ngā mihi nui, faafetai tele lava, 多謝。

Abstract

Language, literacy and learning occur across all environments (both physical and virtual) and across entire linguistic repertoires of emergent bilingual young children. An important way educators and policy-makers can value and support bilingual and multilingual children's use of all their languages is to include their language(s) and related cultural artefacts in their linguistic landscape (physical and virtual). This study used the Bioecological Systems Framework (Bronfenbrenner, 2001), in particular the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006), to illustrate the proximal processes associated with the *linguistic landscape* (LL) and *virtual linguistic landscape* (VLL) that interconnect the home environment and educational setting. Understanding the proximal processes associated with the LL of educational settings aims to inform LL design as a mechanism to influence how languages are perceived, supported and used. Three in-depth illustrative case studies are presented to answer the overarching research question: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? The two points of data collection, approximately one year apart, consisted of photos, screenshots, videos of the LL, interviews with teachers and caregivers, review of associated documents, and a researcher's journal. Findings indicate the majority language of each educational setting was most visible in the LL. Visibility of Māori and other minority languages aligned with the positioning of minority languages within the national curriculum guidelines and its commitment to work within the bilingual context of Aotearoa New Zealand. Māori language visibility in all educational settings increased in quantity and complexity over one year, while other less visible minority languages increased by a lesser extent. Children's digital technology use was limited in all educational settings and educators used the VLL to mediate bidirectional interactions that networked the microsystems of the educational setting and home environment, which supported the development of relationships between teachers and caregivers, and emerging presence and use of minority languages by teachers. This networking strengthened a triadic approach between the LL, people and their contexts, to sustain children's emerging bilingual language development. Thus, designing the linguistic landscape (physical and virtual) of educational settings based on the development of relationships, networks and empowerment, can interweave minority languages within the educational settings to support emergent bilingual children's holistic development in order to mobilise their entire linguistic repertoires across contexts. The teachers expressed a need for further support to engage with minority languages and cultures in the physical and virtual landscapes of educational settings. Recommendations for LL design, policy, theory and future research in the field of LL in educational settings include incorporating the virtual linguistic landscape and the use of the PPCT model. The PPCT model is an effective framework to understand children's holistic development within networked contexts and can illustrate the LL as a mechanism for developing relationships that mediate proximal processes to support the presence and use of minority languages, within and beyond the educational settings.

Contents

Preface

This preface is necessary because this PhD study began within a nationwide programme of research called the National Science Challenges, stimulated by funding from the New Zealand Ministry of Business, Innovation and Employment (MBIE). The preface aims to position my role as a lead research assistant, and my PhD study, within a National Science Challenge research project. In this preface, the overarching framework and Braided Rivers approach adopted by the project is outlined.

This PhD research began within one of the first projects in one of Aotearoa New Zealand's National Science Challenge research programmes: A Better Start: *E Tipu e Rea*. The challenge, launched in 2016, was one of eleven nationwide programmes of research spread across a decade, consisting of five broad themes, Healthy Weight, Resilient Teens, Successful Learning, Big Data and Kaupapa Māori, with cross cutting themes including the digital world. Vision Mātauranga, an overarching framework, involved engaging with cultural advisors, community partners and other universities in New Zealand, and guided the National Science research challenge. The National Science research challenge also adopted a Braided Rivers approach (MacFarlane, MacFarlane & Gillon, 2015) to integrate indigenous knowledge, values, beliefs, traditions and customs with western science. See Figure 1.1 for a symbolic depiction of the Braided Rivers approach.

Figure 1.1: Wai ora mō te māturanga [Living water for education]. A symbolic depiction of the Braided Rivers approach for the Better Start National Science Challenge: E Tipu e Rea. The Challenge braids together knowledge and perspectives from differing sources to advance the Challenge aspirations. (Image obtained from A Better Start project stock images, 2020)

This thesis contributed to the "Emergent Bilinguals in a Digital World" Study Three (Gillon et al., 2019). Study Three was one of four interconnected studies within the Successful Literacy and Learning Project entitled "Eke pānui, eke tamaiti: Braiding health and education services to ensure early literacy success and healthy well-being for vulnerable children" co-led by Gail Gillon and Angus Macfarlane. The Successful Literacy and Learning Project collectively aimed to lift early literacy through an interdisciplinary and bicultural perspective. Figure 1.2 depicts the project overview and positioning of this PhD thesis within the project. The principles of *Kaupapa Māori* (Smith, 1999) research guided the engagement with participants in this PhD research, such as valuing respect, relationships with the participants, transparency throughout the data collection process, and maintaining a high level of communication at all stages. The Kaupapa Māori practices and processes supported all phases of the research process. The interpretation of the research data aimed to be through a more culturally informed lens, this included respect for the ownership of the cultural artefacts images and care with the dissemination of findings generated from the research. The Successful Literacy and Learning project was situated within some suburbs of a large city purposefully selected because of its cultural diversity and over-representation of low-income families.

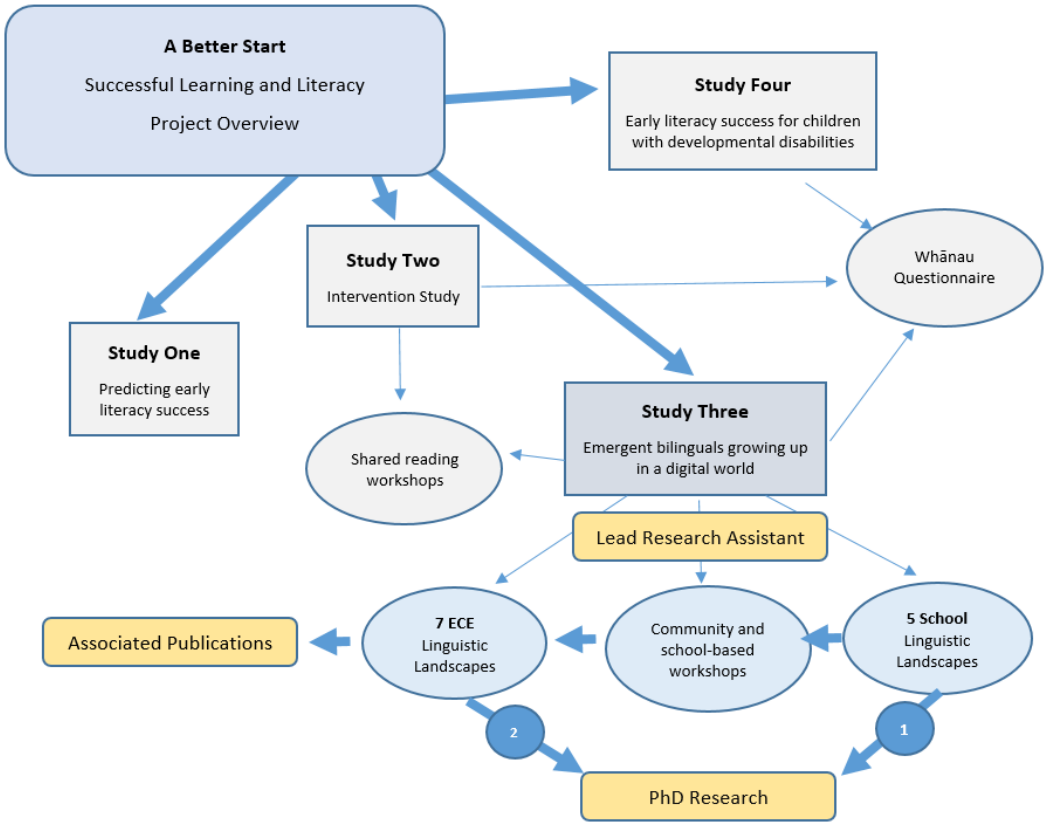

Figure 1.2: An adapted version of the Project Overview (Gillon et al., 2019, p. 5) positioning my participation, collaboration and contributions in yellow. Two ECC and one School from Study Three are the in-depth case studies in this PhD research.

The Positionality of the Researcher in A Better Start

From 2016 to 2019, I was employed in the role of lead research assistant in the "Emergent Bilinguals in a Digital World" Study Three. The work as lead research was in conjunction with work on my Master's (Harris, 2017) and this PhD theses. Between 2016 and 2018, data was gathered from 13 educational settings (eight early childhood education centres and five primary schools). One of these, a Māori immersion Early Childhood Centre formed the basis of my Master's thesis. Three educational settings were selected for in-depth analysis for this PhD research using a theoretical framework that was different to that used in other parts of Study Three. All linguistic landscape data collected in these educational settings from 2016 to 2019 had multiple purposes, including the aim of Study Three; to enrich the LL of educational spaces of 4 to 6 year old emergent bilingual young children (See Appendix 4). Figure 1.3 illustrates the community engagement over the duration of Study Three. This engagement included publication and early dissemination of findings, community workshops and the development of a project website with resources (Davis & Cunningham, 2017). This PhD research builds on my Master's (Harris, 2017) and publications listed below, which had arisen from Study Three.

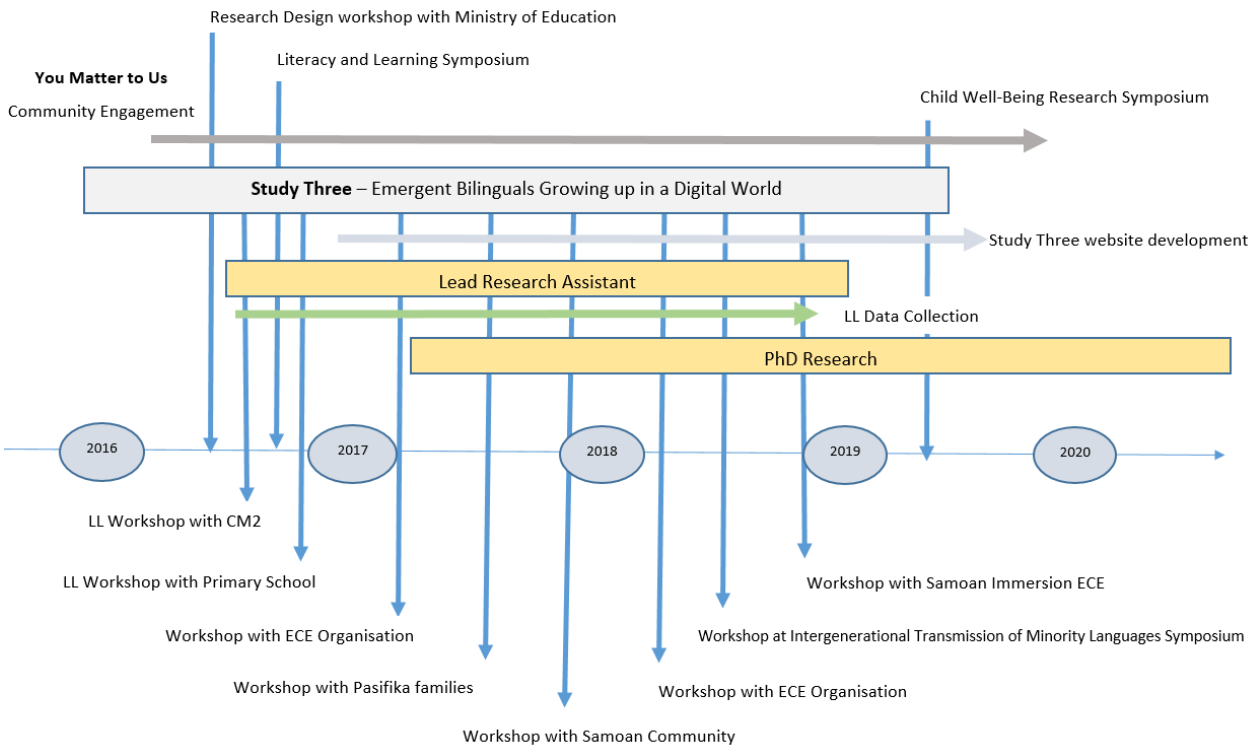

Figure 1.3: Timeline from 2016 to 2020 of community engagement activities and data collection linked with my role as research assistant including my PhD research.

As lead research assistant of Study Three, my role was to undertake all aspects of the research within the study and participate in associated research activities under the supervision of the lead investigators of Study Three, Niki Davis and Una Cunningham. My role and data collection as lead research assistant and PhD student at times overlapped. Whilst I am drawing from the LL data I gathered as lead research assistant of Study Three, the approach to this data and its analysis using the Bioecological Systems Framework (Bronfenbrenner, 2001), in particular the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005), for my PhD can be considered as a unique and original contribution.

Presentations and Publications

Associated with this Thesis and Arising from Study Three

Journal Articles

Davis N., Harris L. and Cunningham U. (2019) *Professional ecologies shaping technology adoption in early childhood education with multilingual children*. British Journal of Educational Technology 50(3): 1320-1339. http://dx.doi.org/10.1111/bjet.12774.

Harris L., Cunningham U. and Davis N. (2018) *Languages seen are languages used: The linguistic landscapes of early childhood centres.* Early Education 64: 24-28.

Harris L., Davis N., Cunningham U., de Vocht L., Macfarlane S., Gregory N., Aukuso S., Ova Taleni T. and Dobson J. (2018) *Exploring the opportunities and challenges of the digital world for early childhood services with vulnerable children.* International Journal of Environmental Research and Public Health 15(11). http://dx.doi.org/10.3390/ijerph15112407.

Conference Contributions

Harris L. (2019) *Visibility of language diversity in the educational settings of 4 to 6-year-olds.* Christchurch: Child Well-Being Research Symposium, 6-7 Jun 2019.

Harris L., Davis N. and de Vocht L. (2018) *"Is my language treasured here?" Supporting linguistic diversity by enriching the linguistic landscapes in early childhood education.* Prague, Czech Republic: 70th OMEP World Assembly and Conference, 25-29 Jun 2018.

Harris L. (2017) *Linguistic landscapes of Emergent Bilinguals in a Digital World. Poster Presentation.* Christchurch, New Zealand: Literacy and Learning Symposium, 26-27 Oct 2017.

Oral Presentations

Harris L. (2018) *Supporting the language development of linguistically diverse young children.* Christchurch, New Zealand: Early Years Professional Learning Hui Kidsfirst Kindergartens, 18 Apr 2018.

Harris L. (2017) *Linguistic landscapes of young emergent bilingual children growing up in a digital world.* Christchurch, New Zealand: CANTESOL mini-conference, 02 Sep 2017.

Definition of Terms

As cultural and linguistic diversity grows, the definitions of home language, first language, heritage and mother tongue become more complex. In a multidisciplinary approach, it is therefore important to clarify the definition and choice of terms for consistency. A. Davis (1991; 2004), took a sociocultural perspective of language acquisition, and recognised that the first language was not a biological given and that language is generated from the social and cultural norms. In this thesis, the following terms are used frequently throughout.

Emergent Bilingual – Defined by Hall (2001) as people who "live in two languages, who have access to, or need to use, two or more languages at home and at school. It does not mean that they have fluency in both languages or that they are competent and literate in both languages" (Hall, 2001, p. 5). It is important to note the two aspects of Hall's definition that relate to this thesis. Firstly, an emergent bilingual is not limited to just two languages, as the emergent bilingual can live in, have access or need to use **two or more languages**. Secondly, an emergent bilingual does not need to have fluency, competency or literacy in any of these languages. Therefore, the key elements of the definition "emergent bilingual" used in this study, is that the emergent bilingual young child **lives in, has access to, or needs to use two or more languages.** This definition is sufficient for acknowledging that in some cases, the number of languages of the emergent bilingual young child may be multiple, and therefore the term **bilingual** includes **multilingual young children**.

Minority language - There are a variety of circumstances to describe the languages of emergent bilinguals. For example, heritage language, indigenous language, home language (L1), minority language, community language, or foreign language. Given that Aotearoa New Zealand is the context of this study, where English is the majority language, **the circumstances of all languages other than English fall into a broad category of minority language**. (Montrul, 2011, 2013; Valdés, 2005). Therefore, the term **minority language** was chosen for this thesis to describe languages other than English.

Translanguaging - Defined by Canagarajah as, '"the ability of multilingual speakers to shuttle between languages, treating the diverse languages that form their repertoire as an integrated system" (Canagarajah, 2011, p. 401).

Schoolscape – The linguistic landscape of a school environment.

Proximal Processes – The key concept of development in the Bioecological Systems Framework and defined as interactions that occur with people, objects or symbols (Bronfenbrenner & Morris, 1998).

Artefact - A selected object or symbol from the LL or VLL captured in the form of a photo or screenshot.

Educators – Adults within, or associated with, the educational setting for educational outcomes.

Abbreviations

DT	Digital Technology - Digital screen media such as televisions, computers, tablets and smartphones
DLL	Dual Language Learner
LL	Linguistic Landscape
VLL	Virtual Linguistic Landscape
PPCT	Process, Person, Context, Time model
ECE	Early Childhood Education
ECC	Early Childhood Centre

Glossary

All minority language terms throughout this thesis will include the English translation, except those listed below that are used most commonly throughout the thesis.

Whānau	Family, extended family or a community of families
Māori	Indigenous peoples and language of Aotearoa New Zealand
Te Tiriti o Waitangi	Treaty of Waitangi
Te Whāriki	Early Childhood Curriculum Document

1. Introduction

Aotearoa New Zealand is regarded as linguistically "super diverse" with over 160 different languages (Royal Society of New Zealand, 2013). English, as the majority and de facto language, is the dominant language within mainstream educational settings. New Zealand census data from 2001, 2006 and 2013 indicated the number and proportion of multilingual speakers in New Zealand increased, with the most common languages in the 2013 census English (96.1%), Māori (3.7%), Samoan (2.2%), Hindi (1.7%), Northern Chinese, including Mandarin (1.3%), and French (1.2%). Despite being the most widely spoken languages other than English, Māori and Samoan do not have the highest intergenerational transmission rates for minority languages in Aotearoa New Zealand (King & Cunningham, 2017). Hall (2001), described emergent bilinguals as people who "live in two languages, who have access to, or need to use, two or more languages at home and at school" (Hall, 2001, p. 5). The Growing up in New Zealand study (Morton et al., 2014) showed that 40% of children in Aotearoa New Zealand at the age of 2 years are exposed to more than one language, therefore by Hall's definition (2001), 40% of children aged 2 years in Aotearoa New Zealand are emergent bilinguals. Yet, census data in 2018 show only 20% of New Zealanders speak two or more languages (Statistics New Zealand, 2018). Tension exists affecting young children's willingness to use their minority languages in English dominant New Zealand, particularly when there is minimal official support for minority languages (Cunningham & King, 2018). Aotearoa New Zealand currently has no official national policy on languages, although a statement on language policy (Human Rights Commission, 2008) provides a framework for all levels of organisations, from government to community, to protect and promote language diversity in Aotearoa New Zealand. However, even with an official language policy there are often gaps between the language policy principles and meaningful implementation through effective practice (May, 2015).

Mainstream education in Aotearoa New Zealand with English as the language of instruction has obligations to support the efforts for Māori language revitalisation, as set out in the founding document from 1840, *Te Tiriti o Waitangi* [Treaty of Waitangi]. Curriculum documents are grounded in the Treaty of Waitangi responsibilities and Māori principles. Early Childhood Education (ECE) has long been considered a potential driver for language revitalisation (Spolsky, 1989), and "long term viability of any language relies on generating ongoing cohorts of child speakers" (King & Cunningham, 2017, p. 30). There are a growing number of revitalisation initiatives showing signs that Māori language use is no longer in further decline, with 2013 Census data indicating that 43.6% of children growing up in a household with at least one Māori language speaker will also speak Māori (Statistics

New Zealand, 2013). The Early Childhood Curriculum Te Whāriki - He whāriki mātauranga mō ngā mokopuna o Aotearoa Early Childhood Curriculum Document (Ministry of Education, 2017), written in Māori and English, draws on Māori concepts and philosophy of *Te Kōhanga Reo* [Māori immersion ECE established in 1983], to conceptualise the Te Whāriki principles, which are, ***Whakamana*** [empowerment], ***Kotahitanga*** [holistic development], ***Whānau Tangata*** [family and community] and ***Ngā Hononga*** [relationships]. These principles are woven together with the five Te Whāriki strands, which are, *Mana atua* [wellbeing], *Mana whenua* [belonging], *Mana tangata* [contribution], *Mana reo* [communication], and *Mana aotūroa* [exploration]. Te Whāriki (Ministry of Education, 2017) defines "oral language" as any method of communication that "the child uses as a first language" (p. 42). Concerns about the decline of oral language skills of young children were raised in a report written for the Ministry of Education (Riley, 2014). Riley noted that school principals were observing a decline in children's oral language skills prompting the Ministry of Education to investigate. The Education Review Office report (2017) on children's oral language (birth – 8 years) indicated, "Improvements were needed in many early learning services to support oral language learning and development" (p. 3). Recommendations for improvements included "capitalising on 'home languages' as a foundation for other language learning" (p. 3).

For primary aged children, the New Zealand Curriculum (Ministry of Education, 2007) and *Te Marautanga o Aotearoa* [New Zealand Curriculum for Māori medium schools] support cultural diversity and the inclusion of children's minority languages. Both curriculums describe the essential knowledge, skills, values and attitudes to ensure the curriculum principles and the learning objectives of each learning area are embedded in school programmes. The seven principles of the New Zealand Curriculum are, **High Expectations** to empower students; **Treaty of Waitangi** to enable students to acquire Māori language and cultural knowledge; **Cultural diversity** to reflect the diversity of New Zealand; **Inclusion** of all genders, races and identities; **Learning to Learn** to encourage students to reflect on their learning process; **Coherence** to enable links across learning areas; **Future focus** encouraging students to look to future focused issues. A statement in the New Zealand Curriculum further describes the term Inclusion*,* to ensure "that students' identities, languages, abilities and talents are recognised and affirmed" (Ministry of Education, 2015, p. 9). The principles of Cultural Diversity and Inclusion are relevant for emergent bilingual young children in mainstream primary education in Aotearoa New Zealand and it is expected that children's minority language(s) are recognised and affirmed within the LL of their educational settings.

It has only been relatively recently that Aotearoa New Zealand has developed a growing awareness of the lifelong benefits of bilingualism (King et al., 2017). These advantages have also been associated with multiple wellbeing outcomes (Bialystok, 2017; Bialystok et al., 2007). Children growing up with two languages may also possess cognitive advantages observed to facilitate the acquisition of a third language, with observed increased phonological flexibility in bilinguals (Singh et al., 2018). As well, cognitive benefits extend to non-verbal advantages, such as, executive and attentional control (Bialystok, 1999), and working memory (Blom et al., 2014). In 2018, migrants to Aotearoa New Zealand were generally encouraged to displace heritage languages in preference to adopting English (Office of Ethnic Affairs, 2018). Despite education curriculums explicitly valuing children's minority languages, multiple languages are unlikely to be sustained into adulthood, with the main significant drop occurring during the transition to primary schools (Tagoilelagi-Leota et al., 2005). Therefore, it is necessary for educational settings to find mechanisms to support the presence and use of minority languages to ensure opportunities for emergent bilingual young children from minority cultures to have the lifelong benefits of bilingualism whilst growing up in majority language societies.

Linguistic Landscapes

The sociolinguistic concept of *linguistic landscape* (LL) captures the visual representation of languages within geographically defined areas, particularly within multilingual societies. An early definition by Landry and Bourhis (1997, p. 23) described a LL as the "visibility and salience of languages on public and commercial signs in a given territory or region". The study of semiotics (e.g., Danesi, 2018), indicates how the symbols and signs visible in the LL influence people's perception about what is considered normal and accepted. Landry and Bourhis found the visibility and salience of languages had a significant carryover effect on the individual's language choices and communicative behaviours. These early definitions framed the LL exploration to uncover LL power, influence and use of languages by majority and minority members of society and associations with local and central language policies (Gorter, 2006; Shohamy & Gorter, 2008). Cenoz and Gorter (2006) also found the LL reflected official language policies; strong language policies tend to protect minority languages and are associated with high visibility of the minority language amongst majority language signs. In addition, influence of language policy on minority language visibility tended to be both direct and indirect. In their study, which was limited to two single street locations with minority language populations situated in Friesland (Netherlands) and the other in Basque Country (Spain), Cenoz and Gorter found that despite

the potential to support minority language use, the creators of the LL, both top-down and bottom-up, may not always share ideologies to support such diverse linguistic development. Sign creators in Cenoz and Gorter's study were not only institutional agencies, under the control of local or central policies and expected to reflect a general commitment to the dominant culture (top-down), but also individual commercial actors free to express a degree of autonomy according to individual strategies (bottom-up) (Ben-Rafael et al., 2006). Given the associations between language policy and LL, Cenoz and Gorter concluded that the LL was an important mechanism for supporting the language development of emerging bilinguals.

Shohamy (2006) states, that the LL "can be considered a major mechanism of language manipulation, as it determines not only the ideological message, but also the choice of languages" (p. 123). People's representations of the world can influence individuals' political beliefs, ideologies, personal and professional actions and agendas. Therefore, the creators and constructors of the LL hold implicitly influential power. Possible tensions may arise in increasingly multilingual and transnational landscapes, where diverse populations may hold distinct cultural assumptions or values yet share physical spaces. Rojo and Reiter (2010) focused on the linguistic practices within service sector institutional spaces and found multilingual individuals were able to "mobilise" their linguistic resources (Rojo & Reiter, 2010, p. 4). However, this mobilisation was not without tensions between the monolingual ideologies and the multilingual practices. The institutions ultimately held the power to decide how to manage linguistic resources.

Drawing attention to the LL of educational settings, both physical and virtual, shows promise in influencing positive ideologies around minority language values, as well as educational outcomes through supporting literacy practices and language awareness (Gorter, 2013). Brown (2005) describes the LL of educational settings as a schoolscape. Brown says a schoolscape "comprises the physical and social setting in which teaching and learning take place. It is the vital, symbolic context in which the curriculum unfolds and specific ideas and messages are officially sanctioned and socially supported in the school" (p. 79). With increasing accessibility and internet access in schools (Crothers et al., 2016), educators are now engaging with families in a virtual setting via online platforms, such as Facebook, Twitter and e-portfolio software (Davis et al., 2018). The *virtual linguistic landscape* (VLL) can incorporate a range of media functions to record children's school progress and learning and bridge the home environment and educational setting microsystems (Davis et al., 2019). Increasing adaptability to diversity in these changing landscapes is now more important than ever with an exponential growth in technological developments and expanding shared spaces for global

interconnection through virtual environments. The increasing engagement with digital technologies expands the LL, so that the LL extends across geographically and institutionally distinct settings in a VLL. The LL can go beyond what is seen and incorporate images, objects, place in time and space, people (Shohamy, 2015) and the VLL. Biró (2018) describes the VLL as distinct from the signs observed in the physical LL, in that signs are transitory, dynamic with delocalized speakers, anyone from anywhere (see for example, Biró, 2018; Jones, 2010; Harris, 2017; Ivkovic & Lotherington, 2009; Tòdor, 2019). Technology is having a more significant role in shaping the ecologies of emergent bilingual children within their educational setting (Davis et al., 2019), enabling the mixed-reality multimodal setting, where the physical and the virtual become a multi-layered and complex learning environment. Since Landry and Bourhis' early definition of LL, the definition of LL has expanded (Shohamy & Gorter, 2008). Language visibility within defined boundaries has moved from geographical to institutional (Gorter, 2013). The LL of educational settings is an example of this growing interest in semi-public environments from multiple perspectives. In this thesis, the LL of interest is the LL (physical and virtual) of educational settings of emergent bilingual 4 to 6-year-olds growing up in Aotearoa New Zealand.

Research Problem

There are few studies on the LL of educational settings; much less, studies of the educational settings of 4 to 6-years inclusive of the VLL that can enrich the LL of emergent bilinguals and facilitate interactions between educators and caregivers. This study builds on LL research studies set in Aotearoa New Zealand, thus far limited to a main street in small-town New Zealand (Macalister, 2010), an international airport (Cunningham & King, 2020), and the educational settings of 4 to 6-year-olds that is associated with this thesis (Davis et al., 2019; Harris, 2017; Harris et al., 2018a; Harris et al., 2018b). In a quantitative approach, Macalister (2010) found in the LL of small-town New Zealand 8.8% of the language visible was Māori, with English as the dominant language and a further 4.1% including languages other than English and Māori. Interestingly, this percentage of visible Māori language representation in the LL reflected a similar proportion of Māori language "loanwords" in English language in New Zealand (Macalister, 2006), which was far from reflecting Aotearoa New Zealand's bicultural commitments. Cunningham and King (2020) found the several examples of Māori language use within LL of the airport was mostly decorative. In addition, Māori words were selected without Māori consultation or advice. The domination of English in small-town New Zealand and only decorative use of Māori in the airport was despite Treaty of Waitangi obligations and the Māori

Language Act (1987) that declared Māori as an official language of Aotearoa New Zealand[1]. The qualitative ethnographic studies in educational settings associated with this thesis (Davis et al., 2019; Harris 2017; Harris et al., 2018a; Harris et al., 2018b) showed more visibility of Māori than in Macalister's (2006) main street in small-town New Zealand. Early findings associated with this thesis (Harris et al., 2018b) provided evidence that ECE settings have rich LLs, with nearly 50% of displays in the centres with Māori visible in part or all of the displays, such as signs, labels, songs, commands, books, portfolios, and communications with the children's family. The educators in the educational settings made intentional efforts to increase the visibility of Māori language, particularly in ECE.

The LLs of emergent bilingual young children are changing with an increase in access to DT and the global environment. In 2012, 80% (1.3 million) of homes had internet connection, with the number of households using more than one device doubling from 2009 to 2012 to 40%. In the last five years to June 2018, unlimited broadband data connections have risen over 700% to more than 1 million, with connections rising by 182,000 in the last year alone (Statistics New Zealand, 2018b). This expanded internet access has also been observed in schools, community facilities, and workplaces (Crothers et al., 2016). The impact of increased access and use of DT on children's language development is an area with limited research, much less on emergent bilingual children's minority language development. Harris et al. (2018b) highlighted concerns that were raised by teachers that DT use may distract and displace necessary interactions for language development, with particular concern for minority languages in majority language contexts. In a 2020 media release from the Growing up in New Zealand study (Ministry of Social Development, 2020) researchers indicated that there has been a significant growth in the number of preschool children speaking Māori language within the home environment, although excessive screen time was found to be a negative predictor for Māori fluency. With increased uptake of DT in educational settings and home environments, there is conflicting research on the benefit of DT as a pedagogical tool for language development. From some educational perspectives, single applications aimed at promoting vocabulary growth (see for example, Teepe et al., 2016; Walter-laager et al., 2016) and e-books (see for example, Hoffman & Paciga, 2014; Korat et al., 2014; Smeets & Bus, 2015) have proved effective. However, from paediatric and other educational perspectives there are concerns around associations between young children's DT use and developmental delays (Marsh et al., 2017; Raman et al., 2017; Zhao et al., 2018).

Early findings from Study Three (Harris et al., 2018b) revealed a digital divide between the educational setting environments and children's home digital experience. This digital divide has also been found

[1] in addition to New Zealand sign language that came into effect in 2006.

in previous research on young children's multiliteracy practices (Arrow & Finch, 2013), which found educators were unaware of children's home multiliteracy practices, which included activities like watching television and playing computer games in a range of contexts that were ambient, used jointly with an adult or sibling, or independently. This points to a lack of educator knowledge of children's popular culture and presents possible limitations for emergent bilingual young children, and the presence and use of minority languages in their LLs and VLLs across the contexts of the home environment and educational settings in which they develop.

The unique situation of Aotearoa New Zealand and the efforts for language revitalisation make LL in educational settings of particular importance. This is due to the linguistic diversity, bicultural commitments and the increasing uptake of DT, including digital screen media such as computers, laptops, tablets and cellphones, present in educational settings and home environments of emergent bilingual young children. The research in this thesis may also be justified by the broader context of Human Rights article 29(c), 30 and 17d on the rights of minority or indigenous children to use their languages. In recent years, the number of languages spoken globally has declined and the threat to the diversity of languages in the socio-ecological system has increased. UNESCO estimate there to be around 3,000 languages classified as endangered languages worldwide with Māori language classified as a "vulnerable" language (Moseley, 2010). May (2008) argued that recognising and expanding minority language rights acknowledges, and better reflects, the interests of multilingual populations in an increasingly globialised world. In addition, the responsibility to enact those rights fall on majority language speakers, to ensure minority language speakers can freely use their language when and where they choose (May, 2018). The United Nations Convention on the Rights of the Child (UN, 1989) includes three relevant articles fundamental to the purpose of this thesis, namely the right of respect for a child's languages and the right for presence and use of their languages both in their physical and virtual landscapes.

Article 29 (c) The development of respect for the child's parents, his or her own cultural identity, language and values, for the national values of the country in which the child is living, the country from which they may originate, and for civilizations different from his or her own.

Article 30 In those States in which ethnic, religious or linguistic minorities or persons of indigenous origin exist, a child belonging to such a minority or who is indigenous shall not be denied the right, in community with other members of his or her group, to enjoy his or her own culture, to profess and practise his or her own religion, or to use his or her own language.

Article 17 (d) Encourage the mass media to have particular regard to the linguistic needs of the child who belongs to a minority group or who is indigenous.

In addition to children's rights here in Aotearoa New Zealand, it is crucial to support the presence and use of minority languages within the LLs of emergent bilinguals as language development of children's early oral language skills have consequences for their later academic achievement (e.g., Miller et al., 2006 Morrison et al., 2005). Therefore, it is expected that in Aotearoa New Zealand's linguistically "super diverse" population, along with Treaty of Waitangi responsibilities, the linguistic landscapes of educational settings will reflect these national level policies and documents, which aim to recognise children's cultural diversity and languages (e.g., Education Council New Zealand–Matatū Aotearoa, 2017).

Research Questions

Given the lack of LL research in educational settings, the aim of this research is to illustrate the LL of educational settings of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand. The LL of the educational settings in this thesis are viewed through the Bioecological Systems Framework and the Process-Person-Context-Time (PPCT) model (Bronfenbrenner, 2001). The PPCT model incorporates the processes, the people, and the contexts of the developing child with the element of time. The PPCT model is explained in detail in chapter two in this thesis. This illustration is limited to the study of the LL (physical and virtual) of a few educational settings plus the associated interactions with the home environment of one emergent bilingual young child in each setting. Four detailed research questions were developed in order to answer the overarching research question: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand?

1. What is the LL (physical and virtual) of a mainstream primary, mainstream ECC and Samoan immersion ECC of emergent bilingual 4 to 6-year old children and do they vary?
2. What are the processes within the educational settings and home environments (microsystem proximal processes) that support the presence and use of minority languages?
3. What are the processes between educators and caregivers (mesosystem proximal processes) that support the presence and use of minority languages?
4. What changes in the LL can be observed over time?

In order to answer these questions the study aims to provide in-depth illustrations of the LL (physical and virtual) of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand. The environments of interest are the educational settings, the home environment and the virtual environments accessed via *digital technology* (DT), defined as digital screen media such televisions, computers, tablets and smartphones.

Organisation of this Thesis

Chapter Two – Conceptual Framework The Bioecological Systems Framework (Bronfenbrenner, 2001) is the conceptual framework applied as both a lens and a frame for the organisation of this thesis. In this chapter the elements of this conceptual framework, in particular the Process-Person-Context-Time (PPCT) model, are described including how those elements are conceptualised in this thesis. This conceptualisation is supported by drawing on the concept of a mediational triangle to understand how an *artefact*, a selected object or symbol from the LL or VLL, can mediate the connection between a person and their environment. Limitations of the conceptual framework are discussed, such as debate around the positioning of DT and culture within the system. The application of the Bioecological Systems Framework is a novel conceptual framework for a multidisciplinary approach to LL research to illustrate the interconnected microsystems of emergent bilingual young children. The conceptual framework in this study provides a more in-depth methodological approach to LL research to be inclusive of the interactions between the people and to understand how the LL is experienced.

Chapter Three - Literature Review This literature review argues for the need to support the continuation of bilingual language development through enriching LL of educational settings to strengthen bidirectional partnerships between the home environment and educational settings of 4 to 6-year-old emergent bilinguals. This chapter situates the research position on bilingual language development as beneficial and describes current understanding of developmental issues and limitations facing emergent bilingual young children, particularly their transition to educational settings. This is followed with sections to understand how children's home and educational settings can support the bilingual language learner with the presence and use of languages within their LL to influence how languages are perceived and used. This chapter concludes with an overview of current LL research in educational settings and identifies gaps in LL research, in particular the limitations on methodological approaches. The conclusions from the literature establish the position on bilingual

language development for this study to argue the need for the continuation of bilingual language development across the home and educational settings.

Chapter Four – Methodology This chapter builds on the LL literature to describe methodological approaches in LL research to show the value in, not only counting the visibility of language within the LL but also understanding how the participants experience the LL. In light of the limitations in current research on LL of educational settings, this chapter describes a blended research paradigm and outlines the ethical considerations, namely a reciprocal relationship approach with Kaupapa Māori informed practices. The reciprocal relationships and Kaupapa Māori informed practices shaped the emergent nature of the methodology. An ethnographic approach was undertaken in order to understand the interactions mediated by the LL of educational setting. An ethnographic approach was deemed the most appropriate given the ethical considerations when adopting a reciprocal relationship approach guided by Kaupapa Māori research practices. This chapter presents three in-depth case studies that illustrate the LL of emergent bilingual 4 to 6-year-olds purposefully selected for this thesis.

Chapter Five - Methods This chapter describes the research methods and analysis used to produce three in-depth illustrative case studies of three educational settings in this thesis. It includes a description of the data collection methods, participant description and a research timeline outlining the data collection steps. Data collection consisted of photos, screenshots, videos of the LL, interviews with teachers and caregivers, review of associated documents, and a researcher's journal.

Chapter Six – Findings This chapter presents three in-depth case studies that illustrate the LL of emergent bilingual 4 to 6-year-olds. The in-depth case study approach gives a more holistic view of interactions within a whole, as opposed to separating parts in a thematic approach. Each in-depth case was purposely selected, analysed and structured using the PPCT model. The presentation of findings in this chapter focuses on a selection of artefacts with interview extracts to illustrate the proximal processes that support the presence and use of minority languages in the LL of emergent bilingual young children.

Chapter Seven – Discussion This chapter draws together the findings presented in the previous chapter in order to answer the overarching research question of this study: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? The summary of findings stem from the

application of the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). Person Process Context and Time of each element of the PPCT model is discussed and includes relevant literature to answer the main research question.

Chapter Eight – Conclusion and Recommendations This chapter concludes this thesis with revisiting the research problem of ensuring sustained bilingual language development for emergent bilingual young children growing up in Aotearoa New Zealand. This chapter identifies the main contributions of this thesis to the body of knowledge associated with the linguistic landscapes of emergent bilingual young children, and ultimately answers the research question. This chapter ends with identifying the research limitations and offers recommendations for LL design, policy, theory and future research.

2. Conceptual Framework

Grant and Osanloo (2014) view a conceptual framework as "the researcher's understanding of how the research problem will be best explored, the specific direction the research will take, and the relationship between the different variables in the study" (p. 17). Based on this view, the conceptual framework in this thesis aims to give a logical structure to the connected concepts. The conceptual framework aims to help visualise how ideas relate to one another from an Interpretivist and Complex-Constructivist perspective, the blended theoretical positions forming the research paradigm of this study.

The conceptual framework selected for this thesis is the Bioecological Systems Framework and, in particular, Bronfenbrenner's *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007). The PPCT model gives priority to the *proximal processes* as the "engines of development" (Bronfenbrenner & Ceci, 1994, p. 584; Bronfenbrenner & Morris, 1998, p. 996), deemphasising the role of context for the developing person, while increasing the emphasis on *how* and *with whom* proximal processes are occurring. Proximal processes (Bronfenbrenner, 1994, 1995, 1999; Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998) are the key concept in development in this conceptual framework and are defined as interactions that occur with people, objects or symbols, such as those that may be present in the *linguistic landscape* (LL). Underlying the proximal processes is the consideration that relationships are fundamental to development, with interactions occurring in the social context that can either support and/or disrupt proximal processes.

This is the first time the Bioecological Systems framework, in particular the PPCT model, has been applied to LL research. The application of this conceptual framework can therefore be considered a new and novel approach to LL research in educational settings. This thesis demonstrated the conceptual framework was an effective framework to provide an ecological perspective inclusive of the virtual environment that networks the school and home environments of emergent bilingual young child. This chapter presents the conceptualisation of the Bioecological Systems Framework (Bronfenbrenner, 2001) and the PPCT model applied in this thesis.

Bioecological Systems Framework

The Bioecological Systems Framework originated from the field of child development and is increasingly used in educational research, which informs curriculum development, such as Te Whāriki Early Childhood Curriculum (Ministry of Education, 2017). Weisleder (2016) argues for a move towards a bioecological model in bilingualism research to better understand how social environments can support bilingual language development. In addition, Schwartz (2018) argues the Bioecological perspectives are essential for theorising the interactions between children, teachers, and parents and their agency in early childhood bilingual education. From an evolutionary biology and neurobiology perspective on language acquisition, Lee et al. (2009) suggested a need to explore the interactional tendencies in relation to language, as opposed to the measurement of language itself. Previous research on educator and caregiver relationships that support young children's emergent bilinguals language development has been guided by the Bioecological Systems Framework (see, for example, Sawyer et al., 2017). Bronfenbrenner and Evans (2000) asserted that the principle focus of their research programme was not "on analysing the development of human beings as such" but for extending the knowledge and development of the tools in research so as to "improve our understanding of the conditions and processes that shape human development" (Bronfenbrenner & Evans, 2000, p. 117). In this thesis, the application of the Bioecological Systems Framework aids in understanding of the processes and threads of interconnectedness between LL, environments, people and children's bilingual language development.

Proximal processes are considered the "engines of development" (Bronfenbrenner & Ceci, 1994, p. 584; Bronfenbrenner & Morris, 1998, p. 996). Proximal processes are defined within two Propositions and are the working definitions of proximal processes in this thesis. Proposition One describes the proximal processes and conditions which best support the developing person. Proposition Two describes the nature of proximal processes and how they interact within the systems of the Bioecological Systems Framework. The PPCT is a more recent model of the Bioecological Systems Framework (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007) that considers all of the elements of the Bioecological Systems Framework. Bronfenbrenner's criticism of his own earlier Ecological Theory of Human Development (Bronfenbrenner, 1977) was that much of the research citing the Ecological Theory was solely focused on context (Bronfenbrenner, 1989), and this deemphasised the agency of the developing person within those contexts. Critique of his Ecological Theory led to the development of Bronfenbrenner's Bioecological Systems Framework (2001), a more developed theoretical system recognising that the human develops within an adaptive

system where the person's own biological factors influence their environment and the environment influences the person. In the 1990s, Bronfenbrenner defined proximal processes as the key factor in development within the Bioecological Systems Framework (Bronfenbrenner, 1994, 1995, 1999; Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998).

This thesis aims to understand some of the conditions and processes within educational environments that shape the development of the emergent bilingual young child. Therefore, the application of the PPCT model in this study is not to analyse the language development of emergent bilingual young children directly but aims to reveal the conditions and processes within the environments that help shape the development of bilingualism. The purpose of the PPCT model is to illustrate the phenomena of interest, specifically the LL in educational settings and the associated adult perceptions of proximal processes that support the presence and use of minority languages with emergent bilingual young children.

The Process-Person-Context-Time model

In this section, elements of the PPCT model are described in detail in the order of Process, Person, Context and Time. The conceptualisation of contexts and the positioning of digital technology (DT) within the conceptual framework follow these descriptions. This section is followed by outlining how the Bioecological Systems Framework, mainly the PPCT model, is applied in this thesis.

Process

Proximal processes were defined by Bronfenbrenner in Proposition One, as the interaction between the subject and the object in the environment. Bronfenbrenner and Morris (1998) gave examples of proximal processes, these included playing with a child or reading activities. In addition, the element of time was also recognised as important, that the proximal processes occurred regularly and over time.

> Proposition One: [H]uman development takes place through processes of progressively more complex reciprocal interaction between an active, evolving biopsychological human organism and the persons, objects, and symbols in its immediate external environment. To be effective, the interaction must occur on a fairly regular basis over extended periods of time. Such

> enduring forms of interaction in the immediate environment are referred to as proximal processes. (Bronfenbrenner & Morris, 1998, p. 996)

Aspects of the proximal process can vary with the individual, because reciprocal interactions with people, objects and symbols can shift in form, power, content and direction, as Bronfenbrenner explained in Proposition Two:

> Proposition Two: The form, power, content, and direction of the proximal processes effecting development vary systematically as a joint function of the characteristics of the developing person; of the environment—both immediate and more remote—in which the processes are taking place; the nature of the developmental outcomes under consideration; and the social continuities and changes occurring over time through the life course and the historical period during which the person has lived. (Bronfenbrenner & Morris, 1998, p. 996)

The bidirectional nature of exchanges (Bronfenbrenner & Morris, 2007) are essential to note, as interactions become mutually influential, in that an individual can influence the environment and the environment can influence the individual. However, according to Bronfenbrenner and Morris (2007), it is the effect of the proximal process on development that is more powerful than the effect of the environment. Given the nature of proximal processes, the quality of the relationship was an important factor for Bronfenbrenner. As early as 1973 Bronfenbrenner stated that "the psychological development of the child is enhanced through his involvement in progressively more complex, enduring patterns of reciprocal, contingent interactions with persons with whom he has established a mutual and enduring emotional attachment" (Bronfenbrenner, 1973, p. 119). This notion was developed further in 2000, when Bronfenbrenner added that proximal processes were enhanced with "persons with whom he or she develops a strong, mutual, irrational attachment, and who, over time, become committed to each other's well-being and development, preferably for life*" (*Bronfenbrenner & Evans, 2000, p. 122). Bronfenbrenner's definition of proximal processes is consistent with Vygotsky's sociocultural theory (Hayes et al., 2017). Vygotsky's sociocultural theory grounds human cognitive processes within social origins, with functions of development occurring through interactions with other people. These functions of development occur on the social level before the individual level, "first between people (interpsychological) and then inside the child (intrapsychological)" (Vygotsky, 1978, p. 57).

In line with Bronfenbrenner's Proposition One of proximal processes, the nature of the interactions need to be reciprocal and increasing in complexity. The responsiveness to the child's needs with reciprocity and increased complexity nudges the child beyond their current level of functioning (Bronfenbrenner, 1993). This conceptualisation of proximal processes is similar to Vygotsky's *Zone of Proximal Development* (ZPD). Vygotsky defined ZPD as "the distance between the actual developmental level as determined through independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). In a practitioner guide on Bronfenbrenner in early years education, Hayes et al. (2017) note an essential element of Bronfenbrenner's proximal processes and ZPD is that interactions are reciprocal (two-way flow) between the practitioner and the child. This bi-directionality of proximal processes was conceptualised in an alternative visual representation of Bronfenbrenner's Process, Person, Context, and Time model by Tudge (2008) and illustrated in Figure 2.1.

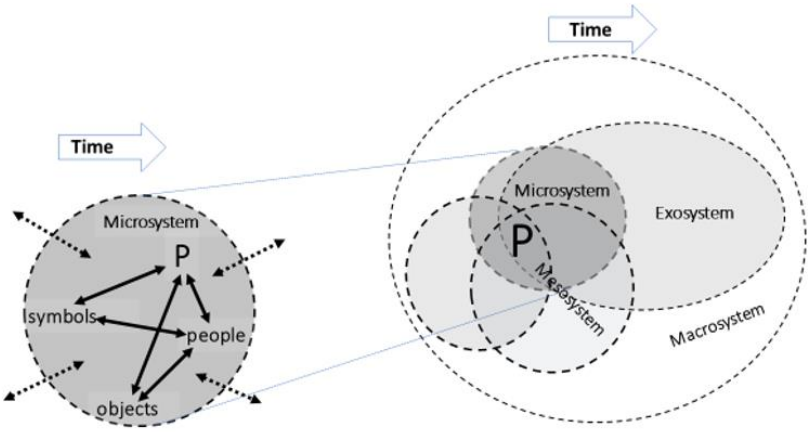

Figure 2.1: Bronfenbrenner's PPCT (Process, the Person, Context, and Time) model. The active *Person* (P) engaging in the *Proximal Processes* with people, symbols and objects within a microsystem, in interaction with other *Contexts*, involving both continuity and change over *Time*. Arrows indicate bidirectional interaction, with solid lines indicating direct interaction and dotted lines indirect interaction (Source: Adapted figure from Tudge, 2008, p. 69 with permission for reuse from Tudge).

Proximal processes may not always be interpersonal. As Bronfenbrenner stated in Proposition One, interactions may also occur with objects and symbols within the immediate environment. In the context of the LL, objects and symbols within the immediate environment are referred to as *artefacts*, and not all artefacts may invite reciprocal interactions, which Bronfenbrenner suggested in Proposition One are necessary for development to occur. To clarify how such artefacts may contribute to development through the proximal processes, further specification on the nature of the artefact is that such an object or symbol "invites attention, exploration, manipulation, elaboration, and

imagination" (Bronfenbrenner, 1999, p. 6). Some artefact qualities may not enable reciprocal interaction, such as a static display. Alternatively, artefacts can mediate the person-to-person interactions such as the *subject-other-object* triangle metaphor used by developmental psychologists Vygotsky and Piaget to conceptualise the social constitution of human development (Zittoun et al., 2007). Cole (2005) illustrates a mediational triangle where cultural intelligence is formed within the interactions mediated by artefacts. This re-conceptualisation of mediation of artefacts, Cole argues, is central to the development of culture. One critique of the Bioecological Systems Framework is the positioning of culture (Figure 2.1) in the macrosystem (Davis et al., 2018a; Vélez-Agosto et al., 2017). Vélez-Agosto et al. (2017) argued that positioning culture within the macrosystem, and therefore separate from the interpersonal interactions occurring in the microsystems, was problematic. Vélez-Agosto et al. (2017) presented a number of studies to offer empirical evidence that the development of culture occurred in the daily routines and practices within the microsystems of the family, educational settings and peer groups. Vélez-Agosto et al. (2017) reconceptualised the Bioecological Systems Framework by placing culture as an integral element of proximal processes by recognising that culture is generated from the daily microsystem interactions.

> Communities and social institutions are also interpretative systems that have the power to change and be changed in those interactions. Culture is embedded in all institutions that have the power to homogenise the daily routines within that context through political policies, laws, and regulations. Individuals interact in different contexts and internalise certain cultural values and practices, making each experience unique from a particular time in life development. Thus, the individual adds diversity to the setting it interacts in (Vélez-Agosto et al., 2017, p. 906).

This position can be supported through Vygotsky's sociocultural theory, where culture mediates experience and transforms human activity, to which Cole would add artefacts within the mediational triangle illustrated in Figure 2.2. Cole (2005) defined artefacts as an "aspect of the material world that has been modified over the history of its incorporation into goal-directed human action" (p. 195). Cole added that these cultural artefacts were simultaneously *ideal* (conceptual) and *material* and mediated the relationship between the subject and the environment. Cole's positioning of artefacts within the mediational triangle was based on activity theory, within which the *subjects* are considered the participants and the *object*s the goals or purpose of the activities. In this study, the subjects include the developing person, as the central person, and the associated people of each microsystem. The object is the proximal processes that support the presence and use of minority languages in the microsystems of emergent multilingual young children; this includes the goal of building relationships in and between microsystems. Artefacts are those associated to the LL of the educational setting.

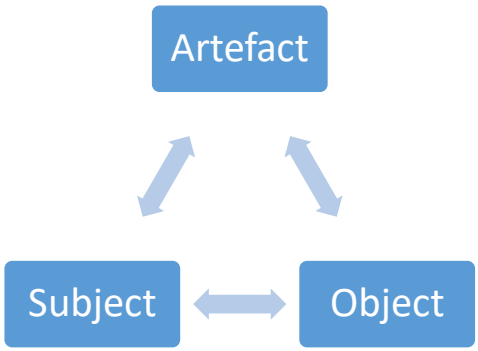

Figure 2.2: Mediational triangle illustrating the subject and object are not only directly connected, but also indirectly mediated through artefacts (Cole, 2005).

From Bronfenbrenner's (1979; 2009) perspective on the ecology of human development, the presence and participation of an additional person to the dyad was crucially essential for the developmental process. The addition of a third supporting person to the mediational triangle therefore, created an effective context for human development. Drawing on examples from other studies at the time, Bronfenbrenner (2009) suggested that this triadic principle be applied to the relationships between settings, such as the existence and nature of social interconnections between the home and the school that strengthened "the capacity of the setting to function effectively as a context for development" (Bronfenbrenner, 2009, p. 6). Bronfenbrenner also argued that, if such third parties were absent or played a disruptive role, the developmental process breaks down. To ensure the effective functioning of the proximal processes, Bronfenbrenner stated that the environmental context needed to provide "stability and consistency over time" (Bronfenbrenner, p. 23), primarily the absence of chaos to support proximal processes. Chaos within the immediate environment of the developing person was also recognised as an additional disruptor of proximal processes. Bronfenbrenner and Evans (2000) defined chaos as systems "characterised by frenetic activity, lack of structure, unpredictability in everyday activities, and high levels of ambient stimulation. Background stimulation is high, and there is a general lack of routinization and structure in daily life. The environment is also a major source of interruption of proximal processes in the form of residential noise, crowding, and classroom design (e.g., open vs. traditional classrooms)" (Bronfenbrenner & Evans, 2000, p. 121). It is therefore important to consider additional people, such as those associated to the microsystems of emergent multilingual young children, and environmental elements, as potential enablers or disruptors of proximal processes.

Person

The Bioecological Systems Framework was developed to address the need to include the biological characteristics of the developing person as influential on the environment. In this section, those biological characteristics that shape the nature of the form, power, content and direction of proximal processes are described in more detail. Bronfenbrenner stated that underlying the Bioecological Systems Framework was a theoretical principle "genetic material does not produce finished traits but rather interacts with environmental experience in determining developmental outcomes" (Bronfenbrenner & Ceci, 1994, p. 571). Bronfenbrenner and Morris (1998) incorporated the biological person into the Bioecological Systems Framework in the 'characteristics of the developing person'. Three characteristics influence proximal processes, namely: *demand*, *resource*, and *force characteristics*. It has been argued in the Process section of this chapter, that interpersonal interactions are bi-directional and reciprocal. Therefore, it is essential to note that person characteristics relate to all persons within the immediate environments in which proximal processes occur:

- Demand characteristics are those, which can be immediately responded to by another person and often influence initial interactions because of immediate impressions. Examples of demand characteristics are age, gender, skin colour and physical appearance.
- Resource characteristics are not immediately observable but may be induced from the observable demand characteristics. The less apparent resource characteristics relate to the mental and emotional resources of the person, for example, social and material resources, and mental and emotional capacities that may relate to past experiences and intelligence.
- Force characteristics relate to more general and persistent states of being, such as temperament, motivation and persistence.

The characteristics of a person can influence and change the environment in ways that are passive, solely through their presence, or somewhat active, through their resource characteristics, or very active, through demand characteristics (Tudge et al., 2009). The biological aspects, defined as personal characteristics, of main interest in this thesis are those characteristics associated with the development of minority languages.

Bronfenbrenner's original Ecological Theory (1977) recognised that environmental contexts, referred to as *systems* (proximate and distal), influenced human development. The influence of the ecology on human development was visualised through the representation of concentric circles, consisting of four systems known as the *microsystem, mesosystem, exosystem* and the *macrosystem*. The central circle, the microsystem, is the environment most proximal to the *developing person*. Figure 2.3 is a representation of Bronfenbrenner's original Ecological Theory indicating the systems within the concentric circles with (P) representing the developing person (Bronfenbrenner, 1977). The developing person could be, for example, an emergent bilingual child. As the location of system becomes more distant from the person, the influence of that system on the developing person becomes more indirect. Bronfenbrenner later added a fifth system that comprised an element of time referred to as the *chronosystem* (Bronfenbrenner, 1995).

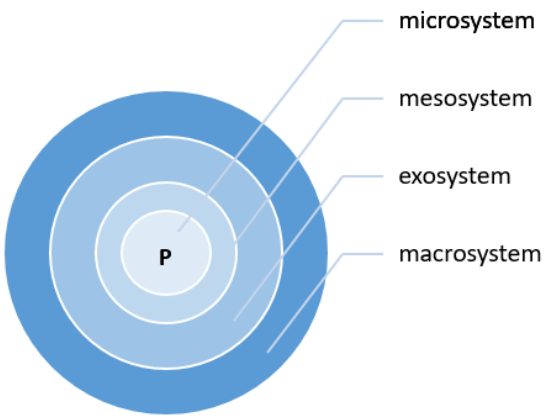

Figure 2.3: A representation of Bronfenbrenner's original Ecological Theory indicating the systems within the concentric circles with (P) representing the developing person (Bronfenbrenner, 1977)

The concentric circle model presented in Bronfenbrenner's (1977) original Ecological Theory is not accepted in this thesis. The concentric circles model for this thesis is too limited when applied to the language development of an emergent bilingual child, particularly when one or more of his or her languages is spoken by a minority culture and related values differ from the majority language that are positioned in the macrosystem. Instead of the simple nesting of systems, this thesis adopts Neal and Neal's (2013) conceptualisation that the systems are "networked" (Figure 2.4) and those relationships between systems are based on understanding the patterns of direct and indirect social interaction. In addition, this conceptualisation positions culture as also generated within the daily

interactions within the microsystems (Vélez-Agosto et al., 2017) and can be mediated by the artefacts (Figure 2.2) within the environment (Cole, 2005). This conceptualisation is most closely represented by Tudge's (2008) visual conceptualisation of the PPCT model (Figure 2.1).

Microsystem

The *microsystem* is the developing person's immediate environment in which interactions and development occur. A young child may develop within several significant microsystems, such as the home environment and the educational setting. Within each microsystem, the developing person will interact with key people, such as a caregiver or teacher, with whom the developing person has an emotional attachment.

Mesosystem

The *mesosystem* influences the child's development but does not involve direct interactions with the child. Interactions may be between adults associated with the child, such as interactions between the teacher and the caregiver. Interactions between adults, especially key adults, can indirectly influence the child's development; for example, a caregiver attending a caregiver education course in the mesosystem can influence the caregiver to use alternative behaviour strategies with the child in the microsystem.

Exosystem

The *exosystem* also has an indirect influence on the developing person. The exosystem consists of wider community environments that do not directly interact with the child; for example, wider community services, neighbourhoods and possibly extended family not considered present in the microsystem. Neal and Neal (2013) identified education policy in the exosystem and the role of school administrators, policy-makers and government officials as indirectly influencing the developing person within the educational setting. In Bronfenbrenner's model, the broader media environment, such as national and international television and movie productions, was also considered an exosystem. Bronfenbrenner did not recognise direct interaction with media, nor the possibility of microsystem content production.

Macrosystem

The *macrosystem* includes overarching beliefs and values, "resources, hazards, lifestyles, opportunity structures, life course options and patterns of social interchange" (Bronfenbrenner, 1993, p. 25). Thus, Bronfenbrenner positions culture within the macrosystem, which encompasses a group of people that share similar belief and value systems, which can influence and be influenced by the encompassed systems within the ecology (Tudge, 2008). As mentioned earlier, this positioning of culture within in the macrosystem has been critiqued by Vélez-Agosto et al. (2017) who argue that culture is generated within microsystems.

Time

Chronosystem - All four systems covered so far are nested within each other. In addition, the more recently described *chronosystem,* representing the effect of time across all systems, is divided into elements of time: micro, meso and macro-time. Micro-time relates to the specific episodes of proximal processes. Meso-time refers to the time over which the proximal processes occur. Macro-time includes generational events that can impact the child's development. A relevant macro-time example is the historical policies contributing to the loss of Māori language, and therefore the reduction of intergenerational language transmission. Because these macro-time events intertwine with the micro-time, historical and generational events can influence the proximal processes for a child's development.

Conceptualisation of Contexts

The conceptualisation of Bronfenbrenner's concentric circles suggested that each context was nested within the wider contexts. Nested was interpreted to mean that if something exists within a nested system then it will occur in other systems. However, these systems could be surrounding, overlapping, or not connected at all. A child's minority culture and language may only occur within the microsystem of the home environment. Therefore, the culture, values and beliefs that support proximal process for the development of minority languages may be limited to a select number of microsystems and not occur in meso, exo or macrosystems. The culture, values and beliefs of the minority language may be embedded in one microsystem and may/may not occur and/or have/not have influence within the dominant culture and language of the macrosystem. Tudge (2008) notes that 'for a particular value

system to influence a developing person, it has to be experienced within one or more of the microsystems in which the person is situated" (p. 69). Therefore, an extended conceptualisation of the systems may aid in mapping overlapping and/or interconnected environments necessary to understand the nature of systems unique to the development of an emergent bilingual young child's minority languages. The embedding of Bronfenbrenner's systems is therefore problematic and an alternative representation of the systems needs to be considered. Figure 2.4 illustrates the Networked Model of Ecological systems, focused on Person A with hypothetical social interactions with multiple persons (B to I), as an adapted proposition of Bronfenbrenner's nested contexts (Neal & Neal, 2013, p. 728).

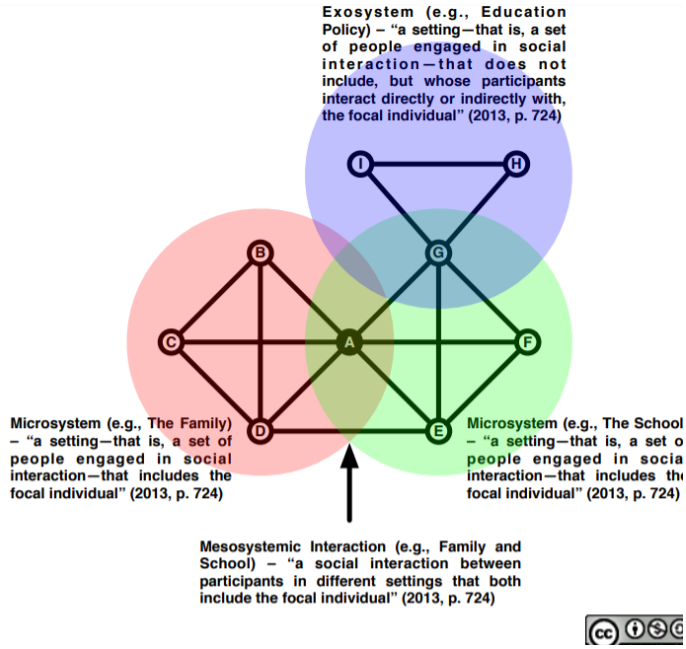

Figure 2.4: Networked Model of Ecological systems, focused on Person A with hypothetical social interactions with Person B to I, as an adapted proposition of Bronfenbrenner's nested contexts (Source: Adapted figure from Neal & Neal, 2013, p. 728 with permission for reuse from Neal & Neal).

Neal and Neal (2013) propose that researchers consider the contexts as "networked" (Figure 2.4) as opposed to Bronfenbrenner's description of the contexts being "nested" (Figure 2.3). Networked contexts are overlapping and based on patterns of direct and indirect social interaction. For example, from a perspective of networked contexts, the mesosystem is defined as a "relationship that bridges two microsystems" (Neal & Neal, 2013, p. 731). Jaeger (2016) also argues that development in a single microsystem is not isolated in nature. Although events may occur physically in a microsystem, essentially all proximal processes are conceptually meso in nature, particularly when experiences from a variety of microsystem contexts influence the developing person's thinking, or any person with

whom they engage shifts across contexts. Considering the mesosystem in terms of relationships allows researchers to study the direct social interactions between microsystems. This networked perspective shifts the focus away from *where* individuals interact and toward *how* and *with whom* they interact, essentially deemphasising the boundaries asserted by Bronfenbrenner's conceptualisation. The emphasis on *how* and *with whom* is likely to be more important and useful when considering a child who has access to digital technologies that can enable more interactions to network systems.

The Positioning of Digital Technology

Lauricella et al. (2015) suggest that the ecological framework of Bronfenbrenner (1979) can explain the complexity of children's use of DT. Johnson and Puplampu (2008) proposed an "ecological techno-subsystem", a dimension of the microsystem involving interaction "with both living (e.g., peers) and nonliving (e.g., hardware) elements of communication, information, and recreation technologies in immediate or direct environments" (p. 178). Johnson and Puplampu argue the techno-subsystem mediates bidirectional interactions between the child and the microsystem, which contrast with Bronfenbrenner's exosystem positioning.

Recent research theorises that the ecological techno-subsystem bridges all nested systems within the ecology, where direct influence can occur via non-consecutive systems. Katz et al. (2015) investigated the differences in parental and child (average age 12.9 years) perceptions on the use of the internet to complete school homework using the Bioecological Systems Framework and Johnson and Puplampu's techno-subsystem. Katz et al. extended Johnson and Puplampu's (2008) definition of the techno-subsystem by describing the bidirectional interaction that bridged all systems within the ecology. The authors used the example of children accessing alternative cultural perspectives, which Bronfenbrenner had limited to the macrosystem. DT interactions within the ecology could occur in any non-consecutive systems, such as the micro and the macro, which Katz et al. highlighted the potential concern about reduced parental awareness of macrosystem influences on their children. Validation of their theoretical positioning of DT within the Bioecological Systems Framework is limited to only a few studies (Johnson, 2010; Paiva et al., 2017; Soldatova, 2018). The techno-subsystem fits well with Neal and Neal's (2013) networked conceptualisation of the Bioecological Systems Framework and establishes the positioning of DT in the conceptual framework of this thesis.

Application of the Bioecological Systems Framework to the Linguistic Landscape

The application of the Bioecological Systems Framework and the PPCT model in this thesis is now outlined in terms of the PPCT elements and conceptualisation of proximal processes. In all of his writings, Bronfenbrenner gave no specific methodological guidance to applying his Ecology Theory or Bioecological Systems Framework (Tudge et al., 2016). However, Bronfenbrenner (see, e.g., Bronfenbrenner, 1995, 1999; Bronfenbrenner & Morris, 1998, 2007), drew on others' research to illustrate the basic elements of the Bioecological Systems Framework that should be applied within a research design. These elements of the PPCT model were summarised by Tudge et al. (2016, p. 428-429).

1. There must be a focus on the relevant proximal processes that are hypothesized to be involved in the developmental outcome of interest.
2. To understand the ways person characteristics influence those proximal processes, at a minimum there have to be two levels of a single characteristic (for example, very low, low or high birthweight used in studies referred to by Bronfenbrenner).
3. To understand the ways context influences proximal processes, researchers need to include in their design two or more groups hypothesized to be relevant to the proximal processes being considered.
4. Any developmental study should be longitudinal

In all of the research articles implementing the Bioecological Systems Framework reviewed for this thesis, only one was explicit in the conceptualisation of proximal processes (Ashiabi & O'Neal, 2015). This conceptualisation informed the development of the conceptualisation of proximal processes in this thesis (see below).

> We conceptualized proximal processes using a proxy measure of parent–child interactions that assessed sensitivity to the child's interest and affect, development of reciprocity and regular routines, and active participation on the part of parent (p. 5).

Jaeger (2016) undertook a literature search process to support the argument that employing the Bioecological Systems Framework has explanatory power in the area of literacy. Jaeger found that the implementation of the framework by researchers varied and did not fully account for all aspects of the model. As well, none of the studies that met the criteria for inclusion gave a detailed description of the proximal processes in their study. Jaeger's inclusion criteria as to what was considered a proximal process is helpful, further conceptualising proximal processes in this study, that interactions,

1. are regular and ongoing.
2. become more complex over time.
3. facilitate the development of both parties.
4. are influenced by the parties' perceptions of the interactions.

Therefore, this thesis conceptualises proximal processes as,

> Regular, direct and mediated interactions with linguistic landscape artefacts (physical and virtual) that support the presence and use of minority languages, and develop over time within the educational settings of the emergent bilingual young child.

Conceptualisation of proximal processes from the PPCT model, elements of which are outlined by Tudge et al. (2016), are applied to the design of this thesis as a conceptual framework, shaping the structure, methodological approaches, research questions, analysis of findings and the development of theory. This conceptualisation reinforces the perspective that individual and environmental characteristics are not the main source of that development, but they may prompt, facilitate or constrain the proximal processes. This echoes Vygotsky's (1978) positioning of social interaction as the fundamental role in development, arguing that children's competencies within the reciprocal exchanges are more important than the child constructing knowledge on their own because it is the reciprocal exchanges that are the fundamental source of development.

Conclusion

This chapter presented the conceptualisation of Bronfenbrenner's Bioecological Systems Framework, including the PPCT model that has been selected for this thesis. Particular attention was given to proximal processes that involve interactions with people, objects or symbols present in the LL and networking of social interactions that connect additional systems associated to the microsystems. An additional person may mediate interactions by forming a link between the person and the artefact, in what Cole refers to as a "mediational triangle" (Cole, 2005, p. 197). Theoretical alignment with Vygotsky was highlighted, as it is recognised that such relationships are fundamental to development, so that interactions occurring within social contexts extend the child's development beyond his or her current capabilities. This conceptualisation of the Bioecological Systems Framework now guides the review of recent literature in four sections; bilingualism, the microsystems of the home environment and educational settings, and the linguistic landscapes (physical and virtual) of educational settings.

3. Literature Review

The aim of this chapter is to explore current literature relating to the central elements of this thesis in order to situate, position and justify the overarching research question in this thesis: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? The first section of this literature review describes the current understanding of bilingual language development and the limitations facing emergent bilingual young children, particularly their transition to mainstream majority language educational settings. This is followed with sections to explore how children's microsystems of the home environment and educational setting can support processes to sustain bilingualism; this includes potential issues faced by minority languages in a majority language and culture. The final section in this chapter reviews LL research in educational settings and highlights methodological gaps to clarify the rationale for the application of the Bioecological Systems Framework as a novel conceptual framework for a multidisciplinary approach to LL of educational settings. This chapter concludes by drawing together the gaps identified in current LL research and explains how this study aims to contribute to the current literature.

Emergent Bilingual Young Children

The definition of an emergent bilingual young child used in this thesis is that used by Hall (2001), who defined emergent bilinguals as people who have exposure to two or more languages at home and at school. He adds to this definition by stating, "It does not mean that they have fluency in both languages or that they are competent and literate in both languages." (Hall, 2001, p. 5) The degree of exposure or fluency in these languages does not determine an emergent bilingual. The emergent element can be simply to just "live in" or "have access to" an additional language. The recognition of environments in Hall's definition, and subsequently the emergent bilingual child's experience of languages within those environments, aligns with Bronfenbrenner's Bioecological Systems Framework (Bronfenbrenner, 2001). In addition, the influence of experiences within environments on bilingual language development connects with Bronfenbrenner's proximal processes, defined as interactions with people, objects and symbols as the "engines of development" within their microsystems (Bronfenbrenner & Ceci, 1994, p. 584; Bronfenbrenner & Morris, 1998, p. 996). In the Introduction chapter of this thesis, the overview of LL research shows that the exposure to language(s) visible in

the LL can also influence perception and use of language(s) (Cenoz & Gorter, 2006; Landry & Bourhis, 1997; Shohamy, 2006) and educational outcomes (Gorter, 2013). Therefore, from a bilingual development perspective, there is value in researching the language environments and the associated language experiences within those environments through the LL of educational settings. Theories on bilingual language development have over time, been varied and influential on pedagogical policies and practices, for example, Universal Grammar (Chomsky, 1995, 2006), the Input Hypothesis (Krashen, 1977, 1985) and Critical Period Hypothesis (Lenneberg, 1967). The variation of theoretical positions gives rise to distinct perspectives on the development of bilingualism. Therefore, it is important to situate the bilingual development perspective of this thesis. Namely, minority language(s) within the educational setting can support and not compromise acquisition of the majority language, educational settings rich (amount and diversity) in minority language(s) can support continued minority language exposure across microsystems, and extensive and systematic exposure of a child's minority language(s) across multiple contexts can sustain their minority language development within majority language societies.

Petitto and Dunbar (2004) investigated prevailing hypotheses relating to children's bilingual language development in cognitive and developmental psychology behavioural studies that compared children exposed to bilingualism from birth, aged 3 years, aged 5 years, aged 7 years and aged 9 years. Petitto and Dunbar's findings may also help to counter some of the uncertainties educators and caregivers might have about children's bilingual language development. For example, uncertainty if the exposure of one language may disrupt the development of the other. Their five main findings are relevant to this study of the LL and VLL of educational settings of emergent bilingual 4 to 6-year-olds.

1. Early (under 5 years) bilingual language exposure is optimal for dual language development and dual-language mastery.
2. Children monolingual from birth, then exposed to a new language between ages 2-9 years of age, can achieve the morphological and syntactic fundamentals of the new language within their first year of exposure. However, this rapid acquisition of new language fundamentals is possible only when extensive and systematic exposure to the new language occurs across multiple contexts, for example, in the community and home, with far less optimal dual-language mastery being achieved if exposure comes exclusively within the classroom.
3. Bilingual children exposed to two languages from birth achieve their linguistic milestones in each of their languages at the same time and, crucially, at the same time as monolinguals.

4. Bilingual children exposed to their new language between ages 2-9 years of age exhibit “stage-like” language development in their new language. Surprisingly, this stage-like development is highly comparable in content to the stage-like language development typical of monolingual children acquiring the language from birth, differing of course in the age when it occurs given the later exposure to the child’s other language.
5. Importantly, introduction of the new language does not ‘damage’ or ‘contaminate’ the home language of the child. (Petitto & Dunbar, 2004, p. 4)

It is important to note that Petitto and Dunbar’s considerations were from a U.S. perspective, in order to comment on the issue of the delay of teaching additional languages until children were older. However, their findings can be applied to the context of bilingualism in Aotearoa New Zealand, such as supporting language revitalisation and bilingual language development of linguistically diverse young children growing up in Aotearoa New Zealand. In the New Zealand context, Māori language exposure in the early years supports the revitalisation of Māori language, as Early Childhood Education (ECE) is considered a potential driver for language revitalisation (Spolsky, 1989). However, it may present a problem to apply Petitto and Dunbar’s findings to emergent bilingual children from other minority cultures at risk of losing their minority language(s). As New Zealand Statistics have shown, despite the linguistic diversity in Aotearoa New Zealand, the transmission of minority languages is challenging to maintain (Cunningham & King, 2017). Although Petitto and Dunbar’s findings are reassuring, that the introduction of a new language will not “damage” or “contaminate” the home language of a child, it does not consider that a majority language could dominate or displace their minority language development if there is no systematic or extensive exposure within and across multiple contexts. In a more recent review of bilingual development research, De Houwer (2020) sought to understand the concern about bilingual young children’s preference for only speaking the majority societal language, with their language refusal becoming more pronounced at age 4 to 5 years. De Houwer estimated about 1 in 4 bilingual children do not speak their minority language(s) within the home environment. One consideration for this estimation put forward by De Houwer is children’s minority language(s) might be ignored by educators in majority language settings. In addition, the language policies of the educational setting may influence language choices of the child as well as the parent. Advice from educators may stem from misinformed concerns that minority language use may detract for the majority language acquisition. Such advice would be counter to the growing understanding that minority language development does in fact support majority language acquisition (Tsai, Park, Liu & Lau, 2012; Winsler, Kim & Richard, 2014).

As the child transitions to the educational setting, continued development of their minority language(s) within the educational setting can support and not compromise their acquisition of the majority language (Petitto & Dunbar, 2004)**.** Cummins (2000) posits that high proficiency in the L1 is a precondition for becoming proficient in the L2. Cummin's (2000) position is reinforced by findings from Mitits et al.'s (2018) in their study of bilingual (Turkish/Greek) children in grades 4 to 10 in Greece. Mitits et al. (2018) found the best-developed L1 Turkish vocabularies grew the most extensive L2 Greek vocabularies. A pedagogical implication proposed by the authors of that study was to promote the development of L2 through taking advantage of L1 in the educational setting. However, this advantage may depend on the child's level of L1 acquisition prior to entering formal mainstream education. This raises the question as to whether learning an additional language sooner is really better if the child has not had sufficient L1 exposure for such an advantage. In a study undertaken by Blom and Bosma (2016), 122 five and 6-year-old Frisian-Dutch bilingual children completed Frisian and Dutch language tasks. Parental questionnaires also measured home language exposure. The study investigated the Age of Onset (AoO) of children who started to learn a new language between the ages of zero and four to determine whether 'the sooner, the better' held true for early child bilinguals. The main finding was that the notion that learning a new language as early as possible is better, was not necessarily be accurate, a finding also confirmed by Unsworth (2016). Blom and Bosma (2016) recommend that instead of learning a new language as early as possible, it might be more helpful to grow substantially the first language before introducing a new language due to older children knowing more concepts to map conceptual and phonological information necessary for vocabulary learning. In their Vietnamese context of their study, Blom and Bosma (2016) found language input (quantity) was a more essential factor than AoO in early L2 language acquisition. This aligns with Pham and Tipton's (2018) examination of 69 bilingual Vietnamese children (6 to 8-year-olds). Pham and Tipton identified that the best external factor predictors of Vietnamese vocabulary outcomes (receptive and expressive) of children growing up in the U.S. was language input and enrichment activities. Pham and Tipton concluded that for continued development of a minority first language, rich and frequent exposure and opportunities for practice are essential. Such rich and frequent exposure in the educational setting may possibly counter language refusal found in De Houwer's (2020) review of research.

Thus, educational settings rich in a child's minority language can support continued exposure across microsystems that support a child's developing bilingualism within mainstream educational settings. However, monolingual educators may experience limitations in their ability to provide such exposure, particularly when conversational turn taking may be the underlying mechanism of language

development (Romeo et al., 2018). The language experiences of emergent bilinguals within their microsystems, particularly talk exposure (amount and diversity) can predict children's second language vocabulary skills (Rydland et al., 2014). The context of Rydland et al. (2014), positions the majority language as L2 with predictors focussed on their L2 development and not their L1, Turkish as a minority language. However, the findings can also support the opposite situation in understanding the nature of talk exposure and language development as it could relate to L1 development in the educational setting. In a study of 26 bilingual children (Turkish/Norwegian) from Turkish immigrant families over 20 preschools in Norway, Rydland et al. (2014) found talk exposure in the educational setting predicted the child's second language receptive skills, with differences in receptive skills being maintained up to age ten. Additional influencing factors were demographic, in particular, maternal education, and the co-ethnic concentration in the surrounding neighbourhood. Rydland et al.'s (2014) longitudinal study followed 26 Turkish immigrant children aged 5 years and 10 years. Maternal education predicted vocabulary growth during elementary school years. However, teacher-led talk, peer talk and co-ethnic concentration predicted children's L2 (Norwegian) vocabulary skills (limited to receptive vocabulary skills) at aged 5 years and were maintained to age 10 years based on growth analysis. One main limitation of the study was the measure of second language vocabulary was limited to receptive vocabulary of the majority language only (Norwegian). It is relevant to a mainstream majority language educational setting, aiming to sustain minority language development, to note that Rydland et al.'s (2014) found it was the diversity of in-peer talk, not the amount, which was the strongest predictor of child vocabulary. Children invented many names and drew on children's popular culture and play with verbalisations used to support collaborative pretending during peer play. Although, an alternative perspective on the invented words could be that some may have been expressions of children's first language as a minority language, therefore perhaps not recognised by the majority language-speaking researchers. Regardless, it highlights that the children's breadth of diversity within their in-peer talk was the element identified as a predictor. Therefore, it could be concluded that elements of the LL that mediate in-peer talk and collaborative pretend play in a way that mobilising children's entire linguistic repertoires to enhance language diversity appears to optimise children's emergent bilingual language development.

Extensive and systematic exposure of a child's minority language(s) across multiple contexts can sustain their minority language development within majority language societies. The risk of displacement of minority language development within educational settings is a relevant consideration for the emergent bilingual children with minority language(s) in this thesis, particularly when a child's minority language experiences maybe limited, such as children who have minority

language exposure limited to a single microsystem. Therefore, drawing on Petitto and Dunbar's findings on bilingual language development to inform an understanding of bilingualism in the context of this thesis, a conclusion is that the microsystem environments, and therefore the LL, needs to be rich with minority language presence and use to support the minority language development of emergent bilinguals. In addition, rapid acquisition of an additional language at a later age can be possible when there is "extensive and systematic exposure" across multiple contexts, also interpreted as applicable to sustaining minority languages within majority language societies. This view aligns with Tudge's (2008) conceptualisation of the Bioecological System Framework as networked and Bronfenbrenner's view that the social interconnections between the home and the school that strengthen "the capacity of the setting to function effectively as a context for development" (Bronfenbrenner, 2009, p. 6). This is of particular relevance to this study as it reinforces the need for rich LL inclusive of children's minority languages across microsystems, such as the home environment and the educational settings. Thus, language diversity can be considered a valuable contributor to an emergent bilingual's language development, particularly within the bidirectional interactions, which includes children's interactions with their peers. In a more recent study, Gámez et al. (2019) found that language diversity of dual language learners (DLLs) was positively associated with the language diversity of their peers. These studies demonstrate the power of peers with rich vocabularies to help L2 learners acquire the school language, but also indicate the potential for peer talk to support the presence and use of minority languages within the school setting to enhance complexity and diversity of language. One recommendation from the authors was for future studies of L2 learners to consider peer contexts (both in the preschool classroom and in the neighbourhood) as a site for L2 development. Relative access to L1 (Turkish) speaking peers within the neighbourhood was not included in that study, but would also be a relevant network offering an insight into a child's minority language experiences. Overall findings from that study highlight that the relationship within both the microsystem (adult/child and child/child) and the mesosystem interactions (caregivers and educators), are important networks for supporting young children's bilingual language development across contexts, particularly if the minority language speakers are empowered. Therefore, it could be concluded from this section of the literature review that to ensure equitable outcomes for all learners the educational settings should promote the development of the majority language of instruction through optimising children's minority languages. This conclusion further reinforces the need to increase the presence and use of minority languages within the LL of educational settings of emergent bilingual 4 to 6-year-olds growing up in Aotearoa New Zealand.

The literature reviewed in this section support the continuation of minority language development in educational settings in order to support the development of emergent bilingualism without displacing minority language development, in order to build on their majority language development. The literature supports the perspective that exposure to language(s) within the environment is key; this includes exposure to minority languages present within the LL of educational settings. Educational settings can reinforce minority language development by ensuring, where possible, systematic and extensive exposure of minority languages occurs across settings, which highlights the importance of networked microsystem and mesosystem relationships for development of minority languages. Empowering minority language speakers within the educational setting can support children's exposure to minority languages, particularly peer talk. Peer talk can increase the quantity and diversity of language input, particularly if teachers are not speakers of the minority language. The literature review now turns to understand further the diversity and complexities within the microsystems of the home and educational setting of the emergent bilingual young child.

Microsystems

This section of the literature review focuses on research on the microsystem environments of the home and educational settings of emergent bilingual young children to understand how these microsystems influence the development of their minority language and interact in the mesosystem. The diversity of family situations and language resources within the home indicates children may be developing bilingualism in a variety of ways. Simultaneous bilingualism occurs when exposed to two languages regularly from birth (or soon after) to enable both languages to be acquired at the same time. Sequential bilingualism is acquiring a solid foundation in one language first before learning another. Subtractive bilingualism is loss in the first language as an additional language develops, such as when a minority language-speaking child enters mainstream education with a majority language as the medium of instruction. Significantly, the literature explores how parental attitudes and practices are influential within both the home and the educational setting. In addition, extra-familial networks and language communities may support the social interactions necessary for the maintenance of minority languages. Finally, variations of approaches, referred to as proximal processes, including those mediated by digital technology (DT), have varying degrees of success in supporting young children's minority language development.

Home Environment of Emergent Bilingual Young Children

The home environment is a microsystem of the developing child in the child spends time interacting within close relationships. In terms of the Bioecological Systems Framework, development occurs through proximal processes, defined as interactions with people, objects and symbols, with regularity over a period of time (Bronfenbrenner & Morris, 1998). For most bilingual children, family plays a critical role in the natural intergenerational transmission of minority languages (King & Cunningham, 2017). For children growing up in majority language societies with majority language educational settings, it is challenging for emergent bilinguals to sustain minority language development (Cunningham, 2011). The language of instruction in mainstream education in Aotearoa New Zealand is English. Although some children are raised as simultaneous bilinguals, with the use of both the minority language and English from birth, other children may acquire their bilingualism sequentially. Therefore, the educational setting may become the primary environment for acquiring the additional language. For sequential bilingual children with minority language use within the home environment, the drive to attain English in the mainstream schooling may place the minority language at risk of not being maintained; consequently, the child may begin to experience subtractive bilingualism after entering mainstream educational settings. Parental ability to provide minority language exposure to children and expand their language exposure parameters, such as across multiple microsystems, along with parental attitudes towards bilingual language development, have a significant influence on children's bilingual language development (Makarova et al., 2019).

The decision to raise a child bilingually is influenced by a wide range of circumstances, including parental attitudes and beliefs that inform their daily language practices and proximal processes. Previous studies have shown that in general, parents perceive bilingualism as an advantage, both economically and cognitively (King & Fogle, 2006; Lee & Kim, 2011; Worthy & Rodríguez-Galindo, 2006). In addition, preserving the development of minority languages has cultural advantages as well as enabling children to interact with family members (Taylor et al., 2008). In a qualitative study involving parents on raising children bilingually (Lee et al., 2015), findings showed multiple factors influencing parents' decision to raise children bilingually. Other influences included additional family members, the children's educational settings and parents' prior bilingual language learning experiences. The 13 participants in Lee et al.'s (2015) study were Spanish-speaking parents and teachers of 3 to 7-year-olds. The study aimed to understand parental beliefs, influences and strategies for supporting bilingual language development. Findings from this study were that most parents felt that they had the primary responsibility for deciding to raise their children as bilinguals, with influence

stemming from the experiences of family or neighbourhood members, as well as schools and communities offering bilingual language programmes. One parent concluded, "The environment [decides] where the child develops [and learns language]" (Lee et al., 2015, p. 512). An additional finding was that parents found there was a lack of information available to support their decisions to raise their children bilingually, and for some, conflicting opinions from family members were influential in their decisions to raise their children bilingually. Tensions were also found to exist between teachers and their beliefs around the maintenance of minority language and development of English as a second language within the educational setting. Few parents and teachers knew how to collaborate successfully to support children's bilingualism and several teachers implied that collaboration could only be through the parent being physically present in the educational setting. This suggests that there is need for illustrating interconnections between emergent bilingual's microsystems to strengthen collaborative partnerships to support children's bilingualism across settings.

Maintaining children's minority languages after entering mainstream educational settings is challenging. In an Australian longitudinal study, Verdon et al. (2014) followed 4,252 young children who spoke languages other than English over the first five years of life. The study aimed to identify patterns of language maintenance and loss amongst emergent bilinguals. A significant finding from their research was that by the age of 4 and 5 years, "a number of children begin speaking English as their main language instead of their home language" (Verdon et al., 2014, p. 177). However, the losses of the minority languages varied between language groups, for example, Arabic children maintained Arabic for longer, over three waves of data collection up until children were aged 4 to 5 years. Interview questions were related to minority language use in the home and the child's receptive comprehension of the minority language. The authors attribute the possibility of maintaining Arabic to the recently immigrated Arabic population. This reflects the element of Time in the PPCT model and its influence on the microsystems. Fishman (1970) presented a model of immigration language shift describing the weakening of natural intergenerational transmission in his three-generation model. In this model, the first generation of immigrants brings linguistic and cultural knowledge to the new setting with strong transmission to the next generation, raising children as bilingual. In the third generation, the natural intergenerational transmission is weaker, with the dominant monolingual language and culture commonly producing monolinguals with little heritage language knowledge. Verdon et al. (2014) also highlighted in their findings, the ethnolinguistic community uniqueness of each language group, and variations in language maintenance and loss. In their summary of this research, the authors state, "this study found that while many Australian children maintain speaking

a language other than English throughout early childhood, many experience a language shift toward English by age five" (Verdon et al., 2014, p. 179). This finding reinforces the importance of illustrating the LLs of educational settings of 4 to 6-year-old emergent bilinguals, to counter the language shift and to maintain children's bilingualism, as the LL is an important mechanism for supporting the language development of emerging bilinguals (Cenoz &Gorter, 2006).

In light of the success of the Arabic populations maintaining Arabic, which authors' attributed the to recently immigrating populations, the role of ensuring more intergenerational networks of minority language speakers is highlighted. Additional success was attributed to a significant relationship between children attending family-based care (for example, involving grandparents) or not attending external educational settings and being more likely to maintain home languages. Additional people, such as family members associated with the home environment, provide opportunities for conversational interactions for the maintenance of minority languages. Verdon et al. (2014) found that the presence of grandparents was significantly related, and siblings were less significant, on children's language maintenance. Other studies have shown that siblings influence the language experience and development of young children within the home environment (Bridges & Hoff, 2014). Extra-familial support shows significance in not only maintaining minority language but also it can be observed in the development of language in monolingual children and provide a protective factor for language development. Baydar et al. (2014) explored the family and community factors that predicted vocabulary skills in young children. In a representative sample of 3-year-old monolingual Turkish children (n=1,017), extra-familial support and neighbours were shown to have a positive contribution to children's receptive vocabulary, particularly for children in vulnerable homes as they showed benefits in language development. The main conclusion to be drawn from this study is that the beneficial outcomes from extra-familial support for language development in general reinforces the position that intergenerational collaboration with educational settings could be an additional protective factor for maintaining minority languages. This conclusion strengthens the perspective of the value in multiple networked microsystems for emergent bilingual young children. An additional finding was that maternal vocabulary was an important resource for language development. Therefore, the resource element of the Person in the PPCT model is of relevance as a consideration in this study on the proximal processes. It also highlights the importance of understanding how the emergent bilingual child is networked with people and microsystems in ways that are influential on the nature of proximal processes, including minority language presence and use.

Decisions around how languages are used within a home environment with more than one language can be referred to as *Family Language Policy* (Spolsky, 2012), where the development of those family decisions on language choices face internal and external pressures and influences, such as the beliefs and interactions with grandparents and the educational settings.

> Each of these participants will have different language practices, different beliefs about the values of the varieties that make up the sociolinguistic ecology of the community, and each may attempt to manage or influence the language practices and beliefs of others. (Spolsky, 2012, p. 5)

Spolsky (2007) asserted that the home environment was a significant domain in regard to language policy, and is therefore influential on the proximal processes within the microsystems of emergent bilingual young children. The nature of the proximal processes, the power, direction, content and form, used within the home to support bilingual language development vary depending on the linguistic resources of family, and the social context with which they are situated. Challenges exist with demands for majority language proficiency increasing as children progress in their schooling. Paradowski and Bator's surveyed 37 bilingual or multilingual families (parents of two different nationalities) with 48 simultaneous bilingual children, 20 of which were 4 to 6-year-olds. In their study, Paradowski and Bator (2018) have shown that parents perceive that having each parent using one language in the One Parent One Language (OPOL) approach, as a Family Language Policy, is an optimal strategy for bi/multilingual acquisition in children. However, they found that there were challenges around maintaining this approach with around half not applying a pure strategy by translanguaging with two languages. Translanguaging is defined by Canagarajah as "the ability of multilingual speakers to shuttle between languages, treating the diverse languages that form their repertoire as an integrated system" (2011, p. 401). The number of languages a child is exposed to within the home environment is dependent on a number of factors. Paradowski and Bator state that one crucial factor was the language used between parents. In their Australian study, Verdon et al.'s (2014) results were optimal for children maintaining a minority language when both parents spoke the same minority language between each other within the home, over and above the extra-familial support. However, not all emerging bilinguals have the opportunity to have both parents speak the same minority language in the home. For some parents there may be a variation in the level of language competency, as not all parents have high proficiency in the target minority language to use between the members within the home environment.

As the quality of language input, that is the diversity and complexity of language, is associated to bilingual language development (Unsworth et al., 2019), factors associated to parental input patterns, mixing languages and use of low-proficiency non-native languages, influence the nature of proximal processes that support the presence and use of minority languages within the home environment. In a study into the degree of non-native input, such as a minority language-speaking parent speaking the majority language, and the bilingual language development patterns of pre-schoolers, Unsworth et al. (2019) support previous research (Place & Hoff, 2016), that non-native input is not detrimental to language development but that it is less beneficial compared to proficient native input. However, recommendations from Unsworth et al. (2019) was that advice to parents to speak non-native majority language to their children may not necessarily be good advice, and that better advice would be to encourage low-proficiency non-native majority speakers to seek out opportunities for their children to have quality interactions with more proficient non-native speakers or native speakers. This is relevant for many educators that do not have high-proficiency minority language abilities. This reinforces the need to illustrate the interconnections between emergent bilingual young children's microsystems to enable proximal processes with people, objects and symbols to mediated minority language presence and use and to ensure the quality and authenticity of the associated languages. An example of this is the use of minority language books as a mediator for high-proficiency language presence and use. Paradowski and Bator (2018) found that all but one family used reading as a "strategy", in other words books as a mediator of proximal processes to support the presence and use of minority languages within the home environment, and they perceived this to be an enjoyable approach to engaging in the target languages. This highlights the role minority language artefacts within the LLs of microsystems that mediate proximal processes to support the presence and use of minority languages, to ensure the necessary quantity of input required to sustain minority language development.

Proximal processes mediated by digital technologies

The fast-growing rate of DT use in the home and the rapid change in variety of applications, content and forms, means it is challenging to keep up with research on the impact on child development, in particular, language development and development of minority languages for emergent bilingual young children. For pre-schoolers, DT in the home environment may expand children's repertoires through communicative and creative tasks (McPake et al., 2013). However, the increasing uptake of DT for young children is not without concern (Harris et al., 2018b). In a more recent review of parental mobile DT use and the impact of the parent-child interaction found that distracted parents were less

responsive to their children, with increased risky behaviours by children to regain parental attention (Kildare & Middlemiss, 2017). This could align with Bronfenbrenner's note that the presence of an additional person (in this instance the presence of the DT) could disrupt the proximal processes occurring between the adult and the child. One implication of decreased responsiveness in the home environment is the displacement of the necessary reciprocal conversations for language development from DT distraction. In Kildare and Middlemiss' review, parents were also likely to use mobile DT to distract children to complete their necessary activities in the home, take care of something or calm down the child (Oduor et al., 2016; Radesky et al., 2014; Radesky et al., 2016).

Much of the research to date, particularly in the field of education, focuses on the potential benefits of single applications to assist in particular aspects of development, such as receptive vocabulary development. Proximal processes occur within the microsystem between the developing person and people, objects and symbols. These types of objects and symbols, such as books and content accessed through DT, can mediate proximal processes for development and enhance the LL of the home environment. For example, there is growing research demonstrating the advantages of e-books for bilingual language development (see for example, Hoffman & Paciga, 2014; Korat et al., 2014; Smeets & Bus, 2015). The power of reading for bilingual language development has been shown to be an effective strategy for both the development of L1 and L2 (Anderson et al., 2017; Bosma & Blom, 2020; Karlsen et al., 2017). Language and behaviour can differ between physical and digital books, with increased engagement and attention to digital books in toddlers (Strouse & Ganea, 2017) and potentially enhancing parent-child interactions to support pre-schooler's vocabulary development (Teepe et al., 2017). E-books can mediate bidirectional proximal processes through interactivity functions in minority languages, inclusive of written text and audio, to support the presence and use of minority language within the home environment. Access to minority language content to enhance the home language environment is a particular advantage for parents with low-proficiency minority language skills in their children's additional languages, for example, books to mediate proximal processes in minority languages was a popular strategy identified by parents in Paradowski and Bator's (2018) study.

How and with whom young children are using DT within the home environment is an area of research that remains relatively limited. The impact of DT use on language development is unclear, much less the impact on bilingual language development or minority language content via DT. In a large European-wide study into the DT use of young children (0-8 years) and families (Chaudron et al., 2015) found that most children used DT individually, and only ever occasionally socially, such as using video

calling to a family member via Skype. In a recent review of the literature (Herodotou, 2017) on the effects of young children's (2-5 years) mobile device use, such as iPads and smartphones, on children's learning and development identified 19 relevant articles. Articles on literacy and language (n=9) were focussed on the evaluation of single applications such as a vocabulary app or e-book. Two experimental studies on vocabulary reported positive effects of touch screens on vocabulary acquisition and development, yet the most significant benefits were observed when screen use was accompanied by adult interaction (Teepe et al., 2017; Walter-laager et al., 2016). Though these findings were limited to only two experimental studies, it does add strength to Bronfenbrenner's hypothesis that an artefact mediated by an additional person, as a support to the DT-child dyad, is more potent for development (see Chapter Two).

Within a socio-cultural framework, social interactions are the basis for development, and relationships are necessary. Interactions with DT have become more interactive, including enabling socially contingent interactions across physical locations, such as the ability to video chat relatives living abroad. Socially contingent interactions via DT have the potential to support language learning (Roseberry et al., 2014). The DT used in this way presents an opportunity for migrant families to connect with extended family in home countries, allowing the home environment to engage with minority language resources abroad. The DT in this example has the potential to expand the networked microsystems of emergent bilingual young children. When considering DT and parental engagement in terms of mediated proximal processes and the development of communicative and social skills, Lusted and Joffe (2018) showed that parents might not necessarily engage with children about their experiences mediated by DT. In their survey of 162 Australian parent/caregivers of at least one preschool or school-aged child (aged 2 to 5 years), Lusted and Joffe found only a small number of parents engaged in commenting and questioning about what is happening on-screen, and conduct follow-on activities related to viewing experiences. While the majority of parents supervised their children's DT use, nearly 50 per cent of parents/caregivers allowed occasional alone viewing. Authors suggest that the lack of frequency of these practices means children's DT experiences are not being optimised to foster children's development of communication and social skills. It is unclear how parent/caregiver engagement in children's DT experiences may have supported communication and social skills in minority languages as identification of the languages spoken within the home environment or the presence and use of minority languages on screen content were not identified. Studies on the advantages of joint attention during the experiences and use of DT in home environment show some interactive media creates affordances for parent-child interaction that are growth enhancing, rather than distracting (Skaug et al., 2018). DT can enhance children's multiliteracy

practices within the home (Liebeskind et al., 2014). However, in their study, Liebeskind et al. (2014) found the mere presence of DT in the home did not enhance children's achievement in language, crucially; it was the parent-child interactions.

This section of the literature review relevant to the home environment of the emergent bilingual 4 to 6-year-olds reinforces that the bilingual experiences of each child is diverse and complex, and there are often limitations and barriers facing both caregivers and educators in order to enable this continuation of minority language development across microsystems. It requires collaborating with the families and the establishment of relationships, relationships that underlie the power of proximal processes necessary for development. Therefore, the inference from these conclusions is that the priority for continued minority language development for emergent bilingual children would be for educators to develop responsive reciprocal relationships with their ECE or school families and communities. In order to understand the nature of these mesosystem relationships, more in-depth knowledge of the microsystems of emergent bilingual young children would support that responsiveness. Minority language development as a right and a resource in this thesis is predominantly interested in the linguistic repertories of emergent bilingual young children. Such rights and resources also includes the knowledge that children gain from interacting with DT, this includes not only *how* but also *with whom* they are interacting. Understanding the linguistic and digital repertories within each microsystem can reveal if a children's language resources are networked across microsystems. The literature review now turns to the second microsystem of interest, the educational setting, including how the microsystems of the home and educational settings interact to form the mesosystem.

Educational Setting of Emergent Bilingual Young Children

ECC and primary schools are common educational settings of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand that may be majority language only, bilingual or immersion. Each of these educational settings are guided by broader ecological influences that inform the daily practices to support the developing child (Bronfenbrenner, 1977; 2001), such as official national curriculum documents aimed at supporting the cultural and linguistic diversity of young children. Attending majority language educational settings creates additional linguistic demands for the bilingual child, as the ideologies, beliefs and perceptions for sustaining bilingual language development can either

support or challenge the language practices experienced in the home environment. In mainstream educational settings, diverse minority languages are likely to struggle for a position within the environment when there are external pressures to develop children's majority language literacy skills. Thus, mainstream educational settings may inadvertently encourage caregivers to prioritise majority language development. In addition, Spolsky (2012) considered the school setting a potential power institution influencing language within the family domain with a majority language as the medium of instruction. Based on the perspective that bilingual language development is beneficial (discussed in the first section of the literature review), it would be relevant for educational settings to support sustained minority language use in the home environment, as minority language is foundational and it supports, not compromises, children's acquisition of the majority language.

Challenges exist for educators aiming to support minority language development of bilingual young children within majority language medium educational settings. Parental perceptions of ECE teachers' support for minority language maintenance within the educational setting varies between families, those that maintain heritage languages and those that do not. Verdon et al. (2014) found parental perceptions of teachers' understanding and support for diverse languages was lower among families with children who maintained home languages. One explanation offered by authors was that parents who were successfully maintaining their children's home languages perceived a less optimal level of support from educational settings. Authors' interpretation of this was perhaps "the teachers were following the desires of the parents to emphasize only English in the childcare setting" (Verdon et al., p. 178). This slightly conflicts with literature reviewed on the home environment where parents perceive bilingualism as a resource (King & Fogle, 2006; Lee & Kim, 2011; Worthy & Rodríguez-Galindo, 2006). The literature reviewed in the Home Environment section of this chapter found parents experienced a lack of information available to support them in their decisions to raise their children bilingually, and few caregivers and teachers knew how to collaborate successfully to support children's bilingualism without caregivers being physically present within the classroom (Lee et al., 2015). Therefore, such reasoning is likely to be an oversimplification of the complexities involved, particularly when considering who has the power within the proximal processes that support the presence and use of minority languages within the educational settings of emergent bilinguals. Given the primary role parents play in the development of minority languages within the home environment, parental partnership, collaboration and empowerment despite not being physically present in the classroom, may be valuable for supplementing linguistically responsive practices within the educational setting. This is an important consideration for monolingual educators, particularly when conversational turn taking may be the underlying mechanism (Romeo et al., 2018) of language

development. It is the teachers' communication-facilitating behaviours within the classroom environment, which predict growth in children's vocabulary (Justice et al., 2018); therefore teacher beliefs and pedagogical practices that facilitate children's translanguaging would be considered a practice to support bilingual language development.

Asset oriented beliefs about bilingualism and cultural diversity align with the "funds of knowledge" perspective (Gonzalez et al., 1995). Perceiving diverse children through a funds of knowledge perspective has been beneficial for preservice teachers building relationships with diverse children families and enabled preservice teacher self-reflection on their attitudes in ways that deepen their understandings (Reyes et al., 2016). Responsive reciprocal relationships have enabled teachers to attend to linguistic diversity, such as giving minority languages value and status in the teaching and learning environment by modelling minority language use, that can counter deficit discourses (Harvey & Myint, 2014), leading to responsive pedagogy. Such pedagogical approaches could utilise children's linguistic and cultural resources to support their language and literacy development. From the Bioecological Systems Framework, responsive reciprocal relationships enabled proximal processes that were bidirectional, equitable, in a variety of forms and inclusive of emergent bilingual young children's entire linguistic repertoires. However, curriculum structures may not take full advantage of children's linguistic and cultural resources, particularly as children transition to primary school education. A language shift towards English can occur before aged 5-years-old (Verdona et al., 2014) and the engagement and collaboration with parents often weakens.

In a study into exemplary teachers supporting the multilingual language development of young bilingual children in ECC, Baker (2019) found the teachers' beliefs and perceptions about bilingualism and diversity were influential. In this qualitative multi-case study design six ECE centres were purposely selected as exemplary preschool classrooms in Massachusetts, US. Data collection included semi-structured interviews with teachers, classroom observations and collection of artefacts. Practices in these exemplary ECE classrooms included encouraging children to share their languages and cultures. Signs were used in children's other languages and in one ECE centre a display of children's family photos, and the flags from their countries encouraged children and families to make connections to their heritage and languages; an extension to this display involved parents creating and collaborating. In one example, parents made a *Counting to Ten* audio resource in their home languages. The examples from the ECEs gave evidence that across all the centres, teachers "went out of their way to cultivate reciprocal relationships" (Baker, 2019, p. 121). Reciprocal relationships with parents indicated each ECC situation was responsive and unique to a particular programme and the

diversity of emergent bilinguals. This study gave examples of opportunities for children to share their expertise, build relationships and create a sense of belonging. Recommendations from this study, in addition to practical examples for classroom practice with emergent bilinguals, included, "teacher educators should first and foremost work to cultivate and nourish asset-oriented beliefs about bilingualism and cultural diversity" (Baker, 2019, p. 129).

There are additional influences and pressures on the educators to emphasize majority language cultures that stem from the macrosystem and exosystem. In dominating monolingual cultures, the measure of a child's academic achievement is often through monolingual testing measures, as in the case of Aotearoa New Zealand with the previously required and now optional National Standards testing in English reading and writing from years 1 to 8. Seldom are the linguistic repertories of bilingual and multilingual children examined to reveal their language development across all of their languages in early years education; identification may often be primarily to identify English Language Learners (ELL) for any allocation of funding for additional support (Slavkov, 2018). Language background profiling of children entering educational settings, typically school enrolment forms using questions about children's language background (Slavkov, 2018), could prove an essential practice, in the absence of rigorous assessment. Particularly, language background profiling that considers that children may have more than one first language (simultaneous bilingualism) rather than a first and second language (sequential bilingualism).

Classification of children's languages as first and second language may be oversimplified, and from the perspective of translanguaging, does not match the current understanding of how bilinguals use their languages (Creese & Blackledge, 2010; Fielding, 2016; García & Li, 2014; Jonsson, 2013; Wei, 2018). Otheguy et al. (2015) suggested that adopting the concept of translanguaging could be beneficial for minoritized communities and their languages because it "helps to disrupt the socially constructed language hierarchies that are responsible for the suppression of the languages of many minoritized peoples" (p. 283). Research investigating language profiling in primary schools across 96 schools from three provinces in Canada (Slavkov, 2018) identified a blended chronological-nativist and synchronic-functional orientation to language background profiling. Chronological-nativist represents a primary focus on the child's linguistic history (i.e. the first or native language). Synchronic-function refers to a child's current language skills, without necessarily viewing them against the backdrop of the language(s) the person acquired at birth. Recommendations from this study included language profiling forms to include questions around not only children's dominating and frequently used languages, but also questions about the home language environment and children's exposure to

languages to “distinguish explicitly between exposure to a language and spoken abilities in a language” (Slavkov, 2018, p. 34). Perceiving emergent bilingual young children through a funds of knowledge perspective is beneficial in bridging the relationships between the home environment and the educational setting. Through these mesosystem relationships, in which bidirectional power is shared, educators and the educational settings in which they are situated can recognise and value the realities of emergent bilinguals and move away from monolingual norms to provide equitable outcomes.

Monolingual norms that can label emergent bilinguals in English majority contexts as English Language Learners, positioning them as deficient in English, fails to acknowledge the funds of knowledge perspective previously discussed in this section. García, et al. (2008), reviewed policies and practices targeted towards emergent bilinguals growing up in the United States of America, and research relevant to the educational programs, assessments, curriculum, pedagogy, resources, and family and community involvement needed to ensure educational equality. They found that many of the inequalities stemmed from policy-makers and educator’s limited understanding of bilingualism. García et al. (2008) recommended that efforts should be made to shift the perspective from children being English Language Learners to emergent bilinguals to ensure outcomes that are more equitable. They identify four critical issues of equity for emergent bilingual children that would be influential on the nature of proximal processes within the educational settings; to provide tailored programmes, fair assessment, adequate resources and to involve parents and communities in these students’ education.

In Aotearoa New Zealand, drawing from an extensive national survey, Shuker and Cherrington (2016) found in order to provide equitable outcomes within educational settings for emergent bilingual children, a positive disposition towards diversity and minority language speakers, which can influence the nature of proximal processes, is necessary for educators (Shuker & Cherrington, 2016). The national survey involved 1,517 ECE services, representing 46.25% of the total ECE services on the New Zealand Ministry of Education's national database. Shuker and Cherrington (2016) analysed teachers’ perceptions of both the challenges and opportunities of working with children from diverse backgrounds in ECE in Aotearoa New Zealand. Authors found that the teacher's perceptions influence their attitudes towards diversity, either as a positive or as a challenge. The conclusion of their analysis was the teachers need to possess positive dispositions towards diversity to "truly welcome, acknowledge and embrace diversity" within the educational settings. In addition, access to support services and professional knowledge was critical, which supports Bronfenbrenner’s (1979, 2009) view that the presence and support of an additional person to the dyad was crucially essential for human

development. Planning cultural events and celebrations, along with daily practices incorporating things like artefacts, songs and words, supported inclusion of cultural diversity across ECE settings, which reinforces the role of the LL in reflecting teacher dispositions. To support linguistically diverse children transitioning into the educational setting, some teachers learned essential words to help children facilitate the development of friendships and to enhance the children's "sense of belonging through language and familiar images" (Shuker & Cherrington, 2016, p. 178).

The literature reviewed in this section outlined the need for interconnected and networked microsystems to support the presence and use of minority languages across settings sustain children's minority language development. In addition, the literature illustrated the nature in which DT is used within the home environment, which could be considered as either a facilitator or disruptor of proximal processes in minority languages. For parents and families with the minority language resources, barriers to collaborating with educators included not being physically present within the educational setting. However, Shuker and Cherrington's (2016) study showed that educator's dispositions towards diversity, as could be reflected in the LL of the ECE settings, were influential as to whether the diversity offered by minority language speaking families was truly welcomed, acknowledged and embraced.

Linguistic Landscapes of Educational Settings

In this section, I review research on the LL of educational settings to understand current findings and methodological approaches and developments. Much of the LL research in educational settings has been interested in LL in terms of children's development of additional languages and the potential for LL in foreign language learning (Aladjem & Jou, 2016; Bever, 2012; Cenoz & Gorter, 2008; Dagenais et al., 2009). Gorter et al. (2012) shifted direction in LL research to explore how the LL can benefit minority languages through the "complex interactions between language, society, identity and power" (Gorter et al., 2012, p. 6). LL research has generally taken a quantitative approach (Landry and Bourhis, 1997) however; arguments that are more recent favour a qualitative approach that is interpretative (see for example, Vandenbroucke, 2015). Overall the methodological approaches in schoolscape research is qualitative (Biró, 2016; Dressler, 2015; Pakarinen & Björklund, 2018; Szabó, 2015), building on Brown's (2005) anthropological ethnographic approaches of photos and interviews with observations, field notes, questionnaires and group discussions.

The LL of educational settings has been referred to as a schoolscape (Brown, 2005; Gorter 2018; Krompák et al., 2020). Brown (2005) was the first to coin the term "schoolscape" when she studied the visibility of Võro in south-eastern Estonian school environments. Võro is an ethnic Estonian dialect and was yet to be considered an official native regional language of Estonia. Brown (2005) found the schoolscape represented the ideologies and identities of the local minority language. Landry and Bourhis' definition of LL relates to the visibility and salience of languages within a defined geographical area, therefore schoolscape can be defined simply as the LL within a physical educational setting. Brown described the schoolscape as being a,

> "…physical and social setting in which teaching and learning take place. It is the vital, symbolic context in which the curriculum unfolds and specific ideas and messages are officially sanctioned and socially supported in the school." (Brown, 2005, p. 79)

Brown's ethnographic research was conducted in Võrumaa (Võro County) schools in 2001–2 and 2004. Regional language activists looked to the educational setting as microsystems to foster the Võro language use and cultural knowledge. Despite the efforts to develop and maintain regional language and identity, Brown argued that "(1) the tradition of using schools as sites for cultivating a strong national identity, and (2) European integration and the new importance of fostering a European identity through education" (p. 79) was marginalising regional identity, and therefore language. Brown's data collection included observations of Võro language classes, interviews with Võro-language teachers, and a case study of an individual school. Brown found symbols of European identity dominated the schoolscape in her study and the presence and use of Võro was delegated to the periphery, with classes as an after school elective and Võro language visibility only due to teachers making an extraordinary effort. Brown concluded the schools "remain largely detached" (p. 87) from the regional language identities of the communities they serve because Estonian state and European organisations dominated, so that their promotion of European and national identities dominated the minimal support of regional-language education. In this way, Brown highlighted the schoolscape as a "powerful force" for influencing language and identities. This powerful force is constructed with multiple layers of "agents, contexts, and processes" (Johnson & Ricento, 2013, p. 14). Although some educational practitioners may succumb to the dominant cultural discourses and local policy, "agents" still have power over the interpretations and appropriation of language policy (Freeman, 2004; Hornberger & Johnson, 2007; Johnson, 2010; Stritikus & Wiese, 2006).

From an applied linguistics perspective, Szabó (2015) undertook schoolscape research in four elementary and grammar schools set within the Hungarian context. This study explored how teachers described the LL and related policies to find if there was an observable difference between state and private schoolscapes. Szabó undertook an innovative "tourist guide technique" (p. 27) which involved the teachers guiding the researcher around the LL whilst the researcher asked questions building on teachers reflections, stories and anecdotes. In this sense, Szabó considers that the researcher and participants "co-constructed narratives and ideologies as we surveyed the material environment together" (p. 27). Interviews were recorded and transcribed and photos (nearly 900 in total) of the school environments were taken and included in conversational analysis and discourse analysis perspectives. The presentation of findings was in the form of presenting representative and characteristic interview excerpts and interviews. Biró (2016) built on Szabó's tourist guide technique, interviewing teachers (n=8) while exploring the space and taking photos (n=340). Biró's LL study was set within four primary schools and secondary schools (two state and two mixed) in Hungary with dominant bilingual languages Hungarian, Romanian and English**.** The focus of the study was on how the schoolscape illuminated the 'hidden curricula' of languages, both state and foreign, taught at the school. The instances of hidden curricula in that study reflected the teachers' language choices as bottom-up creators of the LL. Biró found Szabó's tourist guide technique enabled the researcher and participant (teachers) joint exploration and the ability to combine opinions and perspectives. Analysis of data included the classification based on the people, the product, the place and the period of time the sign was displayed. Pakarinen and Björklund (2018) took a unique angle on their study by focusing on the students' perspective in their explorative case study of one sixth-grade Swedish immersion educational setting in Finland. The aim of the study was to explore the interplay between the signs and the language practices. Data collection built on Brown's approach and included two phases; photos of school locations central to student life and focus group interviews with students. Analysis involved classification of photos by languages (which they found problematic to define), location of signs and curriculum links in a content-based analysis approach to produce three categories; roles as writers, awareness of language use and linguistic identity. Their research did not include interviews with teachers or the VLL.

The LL as a mechanism for the promotion of bilingualism within the educational setting was explored by Dressler (2015), who analysed the creation of signs and the decisions behind making the signs, within one elementary school that offered a German/English bilingual programme in western Canada. Understanding the decisions behind the creation of signs within the LL was pertinent, as the creators are in a position of power to influence how languages are perceived and used within the setting. From

the Bioecological System's Framework perspective, the influence on the creator's decisions can stem from the wider societal macrosystem, such as national language policies and national curriculum documents. The elementary school (Kindergarten to sixth grade), and was part of a larger study of schools. The study aimed to understand the human actions in LL creation and how those actions promoted bilingualism. Data collection methods were photos of signs of the school in one day and included the outside school environment, entrances, classroom wings but excluded inside the classroom and focused on only the signs that the bilingual program students would see. Photos were classified by language and either top-down/bottom-up, those made outside the school (exosystem and macrosystem) or those made within the school (microsystem). The selection of photos as a slide show were presented in teachers focus group interviews with interview questions relating to the sign-making and decision making for these signs. In addition, data explored the purpose and use of signs from the sign maker's perspective. The analysis revealed that the primary sign makers within the educational setting were the teachers and that these teachers faced some constraints in their ability to promote bilingualism. Dressler recommended sign makers explicitly target the promotion of bilingualism as well as for students to draw on their linguistic resources and be creators of bilingual signage, and to lobby for funding for official signs created by the school board, government or outside agency to support the local sign maker's development of a LL that promotes bilingualism.

In Gorter's (2013) overview of the main developments in LL research, Gorter indicated LL in educational settings as a promising direction for LL research and called for future research to build on existing studies, a call which Brown (2018) responded to by revisiting the Võrumaa (Võro County) schools approximately one decade after the original schoolscape research undertaken in 2001 to 2003 (see Brown, 2005). Over the decade, the educational settings in which Võro regional language programme had expanded from primary school levels to pre-primary, with language "nests" modelled on *Te Kōhanga Reo* [Māori immersion ECE] established in Aotearoa New Zealand in 1983. Brown adopted the same methods from the original schoolscape (Brown, 2005), which included interviews with educators and directors, where possible the same people, and took photos of evidence of regional language use, including flags, drawings or artworks. In addition, Brown made participant observation notes and field notes. Brown found there was an increase in the presence of Võro. By including the element of time in the LL research, Brown was able to understand the underlying forces that accounted for the change over time, which Brown referred to as "engines of change" (p. 5), a term not dissimilar to Bronfenbrenner's "engines of development" (Bronfenbrenner & Ceci, 1994, p. 584; Bronfenbrenner & Morris, 1998, p. 996). Brown identified the engines of change in the Võrumaa (Võro County) schools as the increased availability institutionally appropriate materials, the

school's/kindergarten's directors creating marketable appeal of the educational setting to the community, and teachers' commitment to sound, immersion pedagogy (Brown, 2018).

In summary, the earlier schoolscape research reviewed in this section support Gorter's (2018) review on trends in LL schoolscapes, in which Gorter identified five various functions of the LL in the educational setting**.** These functions were related to "the teaching of both subject content and language learning, the development of an intercultural awareness, the teaching of values, and establishing behavioural rules, but also providing practical or commercial information." (Gorter, 2018, p. 81-82). These schoolscape research findings support the view that teachers are influential as the bottom-up creators of the LL with their language choices. In addition, a similar qualitative methodological approach was used across all schoolscapes studies and was inclusive of the participants' perspectives. Krompák et al. (2020) contend schoolscape studies are a useful pedagogical tool in teacher education, to support the creation of translanguaging spaces. This thesis positions LL as an effective mechanism (physical and virtual) to support the presence and use of minority languages in the educational setting, as a means to support emergent bilingualism.

Schoolscapes and the Virtual Linguistic Landscape

Little attention has been paid to the LL of the virtual environment and the VLL. The VLL, defined as the virtual content accessed via *digital technologies* (DT), are those VLL associated with the educational settings. Of all the schoolscape research reviewed in this literature review, analysis of schoolscape findings were exclusive of the VLL, despite Ivkovic and Lotherington conceptualising the VLL in 2009 as an extension to the sociolinguistic concept of LL from the perspective of multilingualism. Therefore, it is important to note that the definition of schoolscape in this thesis is inclusive of the virtual environments associated with the educational setting. Brown (2005) extended her description of the schoolscape later in the 2005 article by stating that the schoolscape was also virtual, and gave examples of the school's website that was inclusive of both Estonian and English. However, despite Brown's original schoolscape research including reference to the VLL, explanation of her observation methods of the virtual environment were not detailed in the research nor was there reference to Brown's original schoolscape definition as being beyond the "physical" setting. The physical and social perimetres to Brown's (2005) definition of 'schoolscape' perhaps limits the temporary and transitional visibility that may occur within the VLL associated with educational settings**.** The inclusion of the VVL is important as the uptake of DT in early years education is increasing within educational settings

(Crothers et al., 2016). In addition, how young children engage with DT across the home environment and the educational settings may vary and teachers may be unaware of how young children use DT to mediate their multiliteracy practices (Arrow & Finch, 2013), some of which may include minority languages. Gronn, Scott, Edwards and Henderson (2014) explored the notion of a digital-disconnect or divide between the home and educational setting in case studies involving 12 children (2 to 12-years-old) in order to gain a context-rich understanding. Gronn et al. (2014) found children had a broader range of DTs available within the home environment that enabled the child to have power in selecting what and how DT was used. Gronn et al. (2014) suggested a consequence of limitations on the range of type and use of DT within the educational setting in comparison to the home was that teachers used DTs in ways that were associated with teaching that is more conventional. An interpretation of this study would also indicate that the educators had power over what and how DT was to be used within the educational setting. This type of educator power over DT use in educational settings may contrast with the common play-based pedagogical approaches in early years education. Understanding the nature of digital play in the contexts of both the home and the educational settings may support educators exploring DT use in play-based approaches. Björk-Willén and Aronsson (2014) found children use DT in creative ways during imaginary play, in ways that expand the rules and fixed design features where play transfers from virtual to physical contexts. Yelland (2011) refers to children's "playful explorations" (p. 6) supported by DT, where interactions involving adults can provide learning opportunities within diverse contexts. Digital free-play, such as that where role-play is an element of the application, have been found to enrich children's play opportunities, subsequently promoting increased play-complexity that increase children's social and cognitive demands (Fleer, 2018), and therefore a child's development. Ultimately, Gronn concluded that the influence of DT use both within the home and educational setting were bidirectional, therefore potentially countering the digital –disconnect notion as it suggested children's DT use across settings is mutually influential.

Digital technology in the educational setting provides opportunities and challenges for educators (Harris et al., 2018). Marsh et al., (2017) highlight a common educator stance towards DT use within the educational setting as "protective". This protective stance could be observed with educational settings with educator's technology-free zones, which contrasts with children's frequent technology use and control over their own DT use within the home. McPake, et al. (2013), in their study into pre-schoolers creating and communicating with DT in the home, argue that practitioners should respond creatively to children's digital experiences and abilities. Therefore, this thesis aims to explore ways in which creative responsiveness may be extended to children's linguistic experiences and abilities, with opportunities for educators to blend children's digital and linguistic worlds to support their

development in their more globally connected realities to empower children's creative expression of their pluralingualism with DT. Utilising children's pluralingual resources, that is the integration of languages with children's linguistic repertoires in response to the changing social context and situation, contributes to the construction of their identities, agency and is utilised to scaffold language learning (Stille & Cummins, 2013).

Educators can use DT to capitalise on children's languages and enhance children's VLL, such as through creatively constructing stories using multiple modalities. Such an approach was explored by Kirsch (2018) using a storybook creator. The storybook creator in this study was an iPad app called iTEO, designed as a tool to enable users to edit and record audio and text with digital pictures to create stories. This app enabled children to make personalised stories drawing on children's own experiences and language using the functions of the iPad. Kirsch's (2018) study was an example of DT use within the educational setting capitalising on entire linguistic repertoire, particularly as it was set in Luxembourg within a trilingual education system with Luxembourgish as the primary language, then German and French more formally taught from Year 1. In the piloting phase of the app development, young children (6 to 7 years) worked collaboratively and co-constructed oral text that leads to feedback and word learning. This research investigated how the children used their entire linguistic repertoire using the iTEO app. Data was collected over two years in one nursery and primary school with 4 to 7-year-olds growing up with a first language other than Luxembourgish at home and included peers working with the focus children. Methods included observations, video-recordings, and interviews with teachers on language use within the classroom and iTEO use.

The use of the iTEO allowed opportunities for children to translanguage in contexts that were social and stemming from the child's experiences. Findings from the research showed that the teachers incorporated greetings and songs into the classroom programme and had established routines to ensure diverse languages that were embedded in classroom practice. Language-specific greetings were used directly with individual children to "connect at a deeper level with these children and aimed at developing positive attitudes towards languages and language learning in all children" (Kirsch, 2018, p. 46). A culture of storytelling was well established within the nursery class, and the teacher interviewed said it was valued as it "builds on [children's] resources and promotes language use" (Kirsch, 2018, p. 46). The transfer of storytelling to iTEO occurred with ease and children directed their learning and use. Observations on language use revealed that on most occasions, the focus children drew on their entire linguistic repertoire. A challenge with this for researchers was whether researcher's own knowledge was broad enough to perceive when children were indeed using their

entire linguistic repertoire. It was not evident in the article if any pretesting on children's linguistic repertoires occurred. In the discussion, Kirsch notes that the findings of children's translanguaging involved children drawing on multiple languages. This finding was in contrast to findings from similar research in mainstream and community school settings where translanguaging was uncommon (Creese & Blackledge, 2010; Jonsson, 2013). Given the evidence from this study, it shows there is potential for student empowerment, creative allowances, collaboration and the LL to create the safety for children to express themselves fluidly as the VLL mediates the mobilisation of all their languages. Kirsch concludes with a reminder to consider the broader ecology, the ideologies and hegemonic forces in the educational system (and beyond) that influence the languages valued, and therefore used.

LL research is an effective research approach to consider the broader ecology, the ideologies and hegemonic forces in the educational system (and beyond) that influence the languages valued and therefore used. However, as previously mentioned, there are limited studies on the LL of educational settings that are inclusive of the VLL, particularly for early years education. Therefore, it is helpful to look at VLL research in other educational institutions. In Biró's (2018) study of VLL of bilingual university students, the exploratory study using 118 questionnaires on multilingualism and language practices present on social media. The findings from this study offer conclusions for future research aiming to expand the understanding of LL that goes beyond the physical space and builds on Ivkovic and Lotherington's (2009) conceptualisation of the VLL. The distinctions between the LL and VLL applied in this thesis are those offered by Biró (2018) and can be summarised as the LL reflecting spoken language in typically fixed and stable signs, demarcated by physical spatial boundaries in which the speakers are interacting. The VLL is distinctly different in that signs are transitory, dynamic, with delocalized speakers (anyone from anywhere) where the VLL may not necessarily reflect the spoken language in the real world with computer-mediated interactions and communication (Biró, 2018 p. 183). Biró added that the multilingual practices are shaped by two constraints in the virtual world,

> …first of all, being a member of the virtual world means *being networked*, being digitally connected to others, and it requires a two-way communication. Secondly, it also means *being in the network*, being part of the virtual linguistic landscape of the social media, and of the Web in general, which refers to a one-way communication itself. (Biró, 2018, p. 183)

The social media site of interest in Biró's study was Facebook and items on the questionnaire related to multilingual and digital proficiencies, perceptions and practices. In addition to the questionnaire, a

"snapshot" case study of Facebook profiles (n=62) captured signs of language choice and use, such as Facebook shares and public comments. The findings showed that despite the VLL being a potential context for multilingual use, a barrier to the potential uses was the lack of language proficiency. The sharing and reading of foreign language texts was less common that the author expected and found that the finding and sharing of foreign language content did not promote multilingualism. The author concluded that minority language speakers will "chose their native language in order to be in the network and being networked". Despite the author's position stemming from one of VLL promoting multilingualism, namely development and use of foreign languages, the findings for minority languages indicate the VLL as a promising context for the development of minority languages. Biró's conclusions for future research is that there were limitations, with data not including direct observations and relying on self-reported data. Biró suggests that further research on VLL could include direct examination of language practice and mapping of a bilingual's language contacts in the user's online network. This approach however would require careful methodological and ethical considerations. It is not clear from this article what "snapshot" refers to exactly, as the presentation of findings did not include any images that contributed to the data.

Gorter and Cenoz (2017) state that LL research inclusive of the VLL poses both "an opportunity and a challenge" (Gorter & Cenoz, 2017 p. 10) as traditional definitions of LL are that the LL is static and therefore possible to analyse social change, however the dynamic and fluid nature of the VLL is more challenging. Capturing the VLL has challenges but it is, nonetheless, an environment in which emergent bilingual young children interact and exist. The resounding conclusion of this literature review is that there is a significant gap within the current schoolscape research exploring and interpreting the LL of educational settings; it is not inclusive of the virtual environment that is increasingly a part of the LL of educational settings and LL of emergent bilingual young children. The application of the Bioecological Systems Framework in this study reinforces that the microsystems of emergent bilingual young children are interconnected through the proximal processes that occur within and between microsystems both physically and digitally. With this framework, it highlights the methodological gaps but also illustrates the interconnection of LL in educational settings with the home environments, particularly the caregiver's experience of the LL. From this perspective, it reinforces the originality and novelty of this research as an important contribution to LL research in educational settings from the multidisciplinary and multi-theoretical perspectives.

Mesosystem Proximal Processes Mediated by Digital Technology

Reflecting on Petitto and Dunbar's (2004) findings, systematic and extensive use across settings of emergent bilinguals is necessary when acquisition of additional languages occurs between the ages of 2 to 9-years, and this reinforces that minority language use restricted to a single setting is likely to be insufficient. As well, the presence of extra-familial support (Baydar et al., 2014), such as that from minority language speaking grandparents and extended family, is optimal for minority language development. In their research, Lee et al. (2015) showed that caregivers valued their children's development of minority languages and viewed bilingualism as an asset; however, despite desires to collaborate with teachers to support their children's language development, a barrier to such collaboration was that caregivers were not physically present within the educational setting. The use of digital platforms as tools to enable the strengthening of communication across physically distinct microsystems may enhance the sense of partnership and collaboration between teachers, caregivers and extra-familial support systems, and possibly be deployed to empower families to use their languages across environments. As well, the networking of connections between children's home and technology use in educational settings can be "consciously mapped to promote productive spaces for children's continuous and rich experiences" (Gillen & Kucikova, 2018, p. 844). E-portfolio software, for example, can support the collaborative partnership between educators and families (Beaumont-Bates, 2017). E-portfolios document learning stories (Carr, 2001) written by teachers and the link emailed to the child's parent(s). Only people who have been approved to receive the stories can access them, and they are password protected (Gallagher, 2018). In ECE in Aotearoa New Zealand, assessment is positioned as occurring within a learning community, which is collaborative and drawing on both the family and wider community contexts (Carr & Lee, 2012).

Gallager (2018) found two e-portfolio companies in New Zealand designed software with the aim to facilitate ease of communication between educators and parents to increase parental connectedness to their child's learning. The measure of the e-portfolio success was the extent in which parents responded and engaged with the learning stories posted. Gallager (2018), as a parent of pre-schoolers herself, added that the e-portfolio software was successful in capturing parents attention by triggering a positive affective response, heightened by the unexpected nature of the email notification or alert and stimulated by images, recordings and other documentation of children's experiences at the ECE in a way the paper-based portfolios would not. In a small qualitative research project, Beaumont-Bates (2017) focussed on the effectiveness of e-portfolios to create collaborative partnerships between caregivers, teachers and children in an ECC. All of the five teachers interviewed said that the e-

portfolio had supported and enhanced collaborative partnerships with caregivers and children. Teachers expressed challenges within engaging caregivers with hard copy physical profile books, and they had found that the e-portfolio had increased parental communication and interaction, as well as enabling engaging participation in children's learning from the wider family network. An additional finding was that teachers thought that the e-portfolio facilitated face-to-face conversations, with information being bidirectional, had increased teachers' knowledge of the home environment and resulted in teachers feeling better positioned to "support and plan more effectively for individual children's learning and development" (Beaumont-Bates, 2017, p. 356). The parents in the study found that the introduction of the e-portfolio had enabled them to increase the number of conversations relating to their children's ECE centre activities, with the sharing of photos and learning stories through the e-portfolio. In addition, sharing children's learning experiences through the e-portfolio also increased the parent/teacher dialogue, which parents felt strengthened the collaborative partnership with educators. Beaumont-Bates did not include details of the children's bilingualism or if there were opportunities for caregivers to partner with teachers to support and develop children's minority languages by enhancing the VLL with minority languages in a bidirectional manner. Despite that, these findings indicate that an e-portfolio can offer opportunities in the mesosystem to create a relational space to strengthen mesosystem relationships.

In a more extensive survey of the e-portfolio systems in ECE settings in Aotearoa New Zealand, Goodman and Cherrington (2015) gathered the perspectives from management, teachers and families in an online survey involving 80 New Zealand ECE services. The majority of parents, teachers and management thought that communication between the educational setting and the parents had improved with the introduction of e-portfolios. Both parents and teachers perceived that the e-portfolio made it easy to access and contribute to the portfolio regardless of location or time. One variation between the educational setting staff and the parents' perspectives was the extent to which children's lives outside of the ECE setting could be communicated through the e-portfolio, with educators perceiving the e-portfolio as more bidirectional than caregivers did. Authors of this research suggested that the variation in the survey data might have been due to the likelihood there was more communication in one direction than the other. Researchers suggested that there is room to develop more bidirectional communication with parents and families. Within the survey questions, there was no particular reference to children being raised as emergent bilinguals or perspectives on how the e-portfolio may support presence and use of minority languages across the microsystems of children. Teachers did make several suggestions for the future development of the e-portfolio, one of which

was to include translations of learning stories for diverse language speakers. The issue of equitable access was raised as parental engagement with the online portfolios varied between parents.

Summary

The literature reviewed in this chapter recognises that there is value in continuously supporting the of minority language development of young children within their educational settings, as well as the other settings that they inhabit. This builds on Petitto and Dunbar's (2004) investigation into bilingualism and reinforces their main findings with a focus on emergent bilingual young children's language experience and nature of talk exposure within the home and school. Importantly, it recognises that educators can promote the development of L2 by taking advantage of L1 in the educational setting (Blom & Bosma, 2016; Cummins, 2000; Mitits el al., 2018) by ensuring rich, frequent exposure to minority languages (Pham & Tiptons, 2018; Rydland et al., 2014). It also reinforces the view that access to minority language as a right and as a resource, which is the position taken in the PhD thesis. Given the complex and diverse family environments, agreement of optimal approaches for bilingual language development is challenging with little support for families even when they look to educational providers for advice and guidance (Lee et al., 2015). The literature identifies parental attitudes towards bilingualism (Makarova et al., 2019) and extra-familial support (Baydar, 2014) are influential for bilingual language development. To build on children's funds of knowledge that facilitates emergent bilinguals translanguaging within a safe atmosphere, educators would benefit from understanding the LL, both physical and virtual, for pedagogy that is more responsive. Responsive reciprocal relationships within educational settings can counter deficit discourses (Harvey & Myint, 2014). As well, bridging the microsystems of emergent bilingual young children can strengthen the two-way sharing between environments to empower and make visible the linguistic resources within the home environment needed to sustain presence and use of minority languages within the educational setting. In the next chapter, the research paradigm, methodological approaches and data collection methods are described as they are applied to this study. The review of literature in this current chapter reinforces an in-depth ethnographic case-study approach, leading with the perspective of the caregiver's experience, to illustrate the LL (physical and virtual) of the educational setting in narrative description, framed by the bioecological model, of the home environment and educational settings experienced by the emergent bilingual young child.

4. Methodology

This chapter outlines the ethical considerations and research paradigm, which have shaped the methodological approach of this research design. This thesis aims to illustrate the *linguistic landscapes* (LL), both physical and virtual, of educational settings of emergent bilingual 4 to 6-year-olds. In line with this aim, an ethnographic methodological approach with in-depth illustrative case studies, interpreted through the Bioecological Systems Framework (Bronfenbrenner, 2001), was deemed the most appropriate methodology. The terms paradigm, methodologies and methods refer to those defined by Teddlie and Tashakkori (2008); a paradigm is a philosophical and social political worldview, methodology a general approach with broad preferences, and methods are the strategies used. This methodology was emergent and is considered as novel and multidisciplinary as it applies the Bioecological Systems Framework (Bronfenbrenner, 2001), in particular the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006) as the conceptual framework for this thesis. The inclusion of the *virtual linguistic landscape* (VLL) accessed via *digital technologies* (DT), including digital screen media, television and computer screens, contributes to the currently limited incorporation of the VLL in schoolscape research (Brown, 2005; Gorter 2018). Methodological approaches within the bicultural and multicultural context acknowledge the power, direction, content, and form of the proximal processes involved between the researcher and participants. Therefore, ethical considerations precede the research paradigm section of this chapter. Subsequent sections in this chapter describe ethnography as a methodology and detail the in-depth illustrative case study approach. Methods for data collection follow in Chapter Five and includes a description of the analysis process, the limitations and novelty of this study.

Relational Perspectives to Ethics

This section of the chapter outlines the argument for adopting a *Relationship Perspective* (Cullen, 2005) to the ethics in this thesis. It outlines the ways in which this research was supported through consultation and outlines engagement with participants guided by Kaupapa Māori informed practices (Walker et al., 2006) to sustain reciprocity as a theme throughout the timeline of this thesis. The ethical considerations were fundamental to informing the methodological decisions, as the Relationship Perspective to ethics and reciprocity shaped the research design and findings. The positioning of ethical considerations at the beginning of this chapter acknowledges the bidirectional

and mutually influential interactions between the researcher and participants within a culturally and linguistically diverse context.

Fleischmann et al. (2011) argue that nationality and culture are inherently related to the decisions people make about ethics. When there is more than one nationality and culture, issues arise in the interpretation and application of ethical principles. A universal set of principles of Justice, Beneficence and Respect for Others was created after the atrocities of World War II and published by the United Nations as The Universal Declaration of Human Rights (UN, 1948). These principles have become the basis of ethical codes and principles worldwide; however, they remain fundamentally a western perspective. There are concerns of western bias as Bielefeldt (1995) suggests, as just one example, there are still many tensions between human rights considered normal in traditional Islam and internationally. Combining the ethics of the researcher with the ethics of a different nationality and culture requires an ethical continuum. The researcher may choose either to completely assimilate the ethical beliefs of the culture, completely separate from the nationality and culture and place a higher priority on their own personal ethics (Anderson, 2011) or negotiate their ethics somewhere in between.

A researcher can therefore adopt either a Principalist Perspective based on universal principles, or a Relationship Perspective which considers the situation and context of the research (Cullen, 2005). The Principled Perspective is an authoritarian, top-down approach to morality that is "far less appropriate in dealing with the complexities of everyday life and educational enquiry." (Small, 2002, p. 393). Small (2002) suggests that it is even more difficult in unfamiliar environments. The outsider researcher may minimise risks related to power and language, but during the research may discover that the understanding of ethical concepts are different, so that this requires flexibility. Very often, it is difficult to avoid conflict between the authority of an ethical board and negotiations stemming from the context of research. However, a Relationship Perspective increases the need for consideration of power and language and the understanding that ethical values between cultures may vary. This takes time, which may be in short supply. Ethical decision-making is collaborative and ongoing and participant involvement in the development of the research involves communication and negotiation of power and language between cultures. All parties need to have awareness of these shifts and commit to an open discussion.

The researcher needs to understand the power relationships that exist amongst the cultural group itself, and how they are positioned in that hierarchy of power. For example, researchers can bring

their own cultural understanding of authority structures and follow correct ethical procedures for their own institutions, which may be fundamentally different in a culturally unfamiliar context. Researchers need to reflect on how they gained access to participants and ask if they have followed the correct procedures of the local culture. Their links to authority may affect the concepts of voluntary participation, coercion, confidentiality and participant safety. To participate or not may influence the participant's status, reputation and future relationship with the authority. To minimise risk, researchers may opt to follow the protocols and procedures of the academic field, seeking advice to help situate their work within the local framework of authority in educational research.

The research context of this thesis (outlined in the Preface) took a Relationship Perspective, which was guided by Vision Mātauranga (MBIE, 2020) and adopted a Braided Rivers approach (Macfarlane, et al. 2015). An important purpose of Vision Mātauranga policy is for research to "unlock the potential of Māori knowledge, people and resources for the benefit of New Zealand." As a non-Māori researcher working as a research assistant within the E Tipu e Rea programme of research, I was guided throughout the duration of my study by project leaders and associated cultural advisors, along with the larger project consultation with Māori and Vision Mātauranga.

Kaupapa Māori Informed Practices

To ensure that ethical concepts of informed consent, voluntary participation, right to withdraw, permission, coercion, deception, confidentiality, anonymity, participant safety, researcher safety and dissemination (Mutch, 2005) are met, the researcher may negotiate along a continuum of ethical principles, and adopt a Kaupapa Māori framework (Walker et al., 2006). I adopted Kaupapa Māori informed practices to integrate cultural responsive ethical considerations to enact a Relationship Perspective. I endeavoured to sustain reciprocity, as an indigenous ethical theme with participants to ensure equitable power and outcomes for participants. The benefits and obligations I had whilst in relationship with my research participants were observed through the application of Kaupapa Māori informed practices to build safe, trusting and ongoing relationships with participant. These relational aims are considered significant as a non-indigenous researcher in indigenous language education (Hall & May, 2013) and were valued in this thesis within the bi/multicultural contexts of educational settings in Aotearoa New Zealand.

Hudson and Russell (2009) categorise reciprocity as an indigenous ethical theme enacted by, "ensuring there are mutual benefits and they are realised within indigenous groups in an equitable manner" for

an equitable outcome (p. 66). I integrated Hudson and Russell's (2009) notion of reciprocity as an indigenous ethical theme to ensure benefit sharing and equitable outcomes for participants. Harrison, et al. (2001) also argue that reciprocity, as viewed through their application of feminist ideals, builds trustworthiness in qualitative research. They suggest, "Researchers do consider and show how they consider the benefits and obligations they have while in relationship with their research participants. This move makes explicit the intimate connections between ethics and rigor (Lincoln, 1995)" (Harrison et al., 2001, p. 342).

The following seven Kaupapa Māori practices for researchers (Smith, 1999, p. 120) were followed and the application of these practices in this study are described in more detail.

1. **Aroha ki te tangata (a respect for people)**

In all interactions it was important for me to demonstrate Aroha ki te tangata (a respect for people), including respecting the diversity of cultures within each educational setting. An example of this was that all written communications integrated greetings and salutations in Māori and other minority languages associated with the educational setting. I was also mindful of not demanding too much time and attention from the participants, particularly the primary school educators who had participated in the Study Two intervention (Gillon et al., 2019). The intensity of reciprocal engagement was generally based on the responsivity of the participants and cues given in communications that indicated a willingness to reciprocate.

2. **Kanohi kitea (the seen face; that is, present yourself to people face-to-face)**

This study took place within ongoing communication with educational settings so that each stage of the data collection phases and analysis remained visible to the participants. Engagement also included a balance of electronic communications and Kanohi kitea. I ensured that any documentation sent electronically was also delivered personally in paper form. Since the delivery of the final report, electronic communication remains open.

3. **Manaaki ki te tangata (share and host people, be generous)**

Manaaki ki te tangata took a variety of forms including community workshops, in educational settings, community facilities or the university. At the end of each data collection phase reports were given to the head educator. Reports included emerging findings, the analysis of displays containing linguistic items, a discussion of selected artefacts and interview themes and supporting literature. For some educational settings, Manaaki ke te tangata included the creation of LL videos, and/or co-construction

of LL resources both physical and virtual. Any resources stemming from their LL were presented for review, feedback and validation before any publication. At all stages of the research it was important to ensure that a suitable *koha* [gift] was offered to acknowledge participants' participation in the research. For caregivers this was a $15 shopping voucher. Smaller scale workshop participant interviews held within educational settings included me bringing *kai* [food] to share.

4. Kia ngākau mahaki (do not flaunt your knowledge)

Research inside the educational setting consisting of the researcher collecting data may create a power imbalance between researcher and participant. This may create the need for awareness and engagement in the power-sharing process (Smith, 2008)**.** Power imbalances could compromise participant safety as participants may feel intimidated or judged. Therefore, as a researcher, kia ngākau mahaki was a constant consideration, and I was mindful that my disposition during the co-constructing knowledge in interviews was that of positioning the participant as the expert of their own experience and included questions that aimed to understand the participant's experience more fully. The sharing of knowledge was also reciprocal and ranged from personal to professional narratives.

5. Titiro, whakarongo … kōrero (look, listen … speak)

Open consultation about the aims of the research may help to reduce power imbalances, particularly the aim of an appreciative perspective on participants' lived experiences and expertise. This appreciative disposition was reinforced by being mindful to approach the interviews with Titiro, whakarongo … kōrero. The semi-structured nature of the interviews facilitated a conversational approach to the researcher and participant interaction as the interview process took an equitable partnership, co-constructing knowledge and placing a priority on looking and listening before speaking.

6. Kia tūpato (be cautious)

The educational settings were located in one common area of the city; they may be easily identifiable as there are a limited number of educational settings in this area, which could potentially reduce confidentiality, and anonymity of participants. I was mindful to remain cautious and always adopt a conservative approach when reporting details and aspects of the participants. Ongoing consultation with participants has occurred through the dissemination of findings related to this study, with permission sought from educators to use any information that would be identifying, including digital photos of the LL. There could be a cultural variation in the values of anonymity. In many cases, identification could add prestige to the school, particularly as this study took an appreciative lens.

7. Kaua e takahia te mana o te tangata (do not trample over the mana of people)

Kaua e takahia te mana o te tangata was fundamental to the Relationship Perspective. An appreciative approach ensured this study maintained the integrity of the participants and their associated organisations. Anonymity was discussed with Head Teachers throughout the research and in relation to various research dissemination and target audiences. In some cases identification was preferred, and was thus considered as a contributor to the *mana* of the educational setting (Pere & Barnes, 2009). In cases where identification was not preferred, a change of the locating details of the educational setting and participants was acceptable. No identifiable interview data was used without permission. To ensure confidentiality, pseudonyms were used and identifying details were mixed so that no comments can be traced back to any individual.

This section has outlined the Relationship Perspective to ethics taken in this thesis. Reciprocity, as an indigenous ethical theme, was enacted through engaging in Kaupapa Māori practices to endeavour to address equity of power and beneficial outcomes for participants in this thesis. Reciprocity as an indigenous theme to ethics was enacted by adopting seven Kaupapa Māori informed practices, illustrated with examples of researcher engagement and interactions with participants. This now leads to the philosophical perspective of Interpretivism and the theoretical influence of Complex-Constructivism that forms the research paradigm for this study.

Research Paradigm

The term 'philosophical perspective' indicates what underpins and defines research assumptions about the nature of reality (ontology) and knowledge (epistemology). Philosophical perspectives and researcher assumptions about the nature of reality influence methodological approaches and the ways to access knowledge through methodology. The research paradigm in this study is multi-theoretical, Interpretivism blended with Complex-Constructivism theory. The lens of the participant determined the validation procedures, namely disconfirming evidence and prolonged engagement in the field. This determination was based on the validation selection framework suggested by Creswell and Miller (2000). The lens of the study participant was of primary interest in this study. However, in light of the research context, ethical considerations and subsequent methodological approaches, the lens of the researcher was also considered.

Interpretivism

The interdisciplinary nature of this thesis draws on the fields of education, socio-linguistics, and child development, with networked physical and virtual environments accessed through *digital technology* (DT). Research in the sociolinguistic field of LL has been traditionally quantitative and mostly underpinned by a more positivist theoretical positioning (for example, Landry & Bourhis, 1997). There is growing interest in the multiple perspectives of how people are experiencing and interacting within interconnected contexts, for example, the expanding VLL (Ivkovic & Lotherington, 2009). Interpretivists consider that there are multiple realities across any group of people (Johnson et al., 2007). This means that there is no singular 'truth' that can be gained from any one person's interpretation, as there are multiple ways of making sense of the world (Denzin & Lincoln, 2005). A multiple reality perspective is particularly relevant when an individual's interpretation may occur through distinct cultural frames that are varied, fluid and across networked contexts. This notion of "networked", conceptualised in Chapter Two by Neal and Neal (2013), shifts the focus of *where* individuals interact to *how* and with *whom*. This study does not discount that one reality exists, but it endeavours to humanise the reality of the participant (Frosh, 2007). To do this I endeavoured to keep the participant close to the interpretation of the data, such as listening to audio interviews when analysing transcripts in order to capture how the participants expressed themselves. This aligns with Geering (2007), who defines Interpretivism as an "attempt to interpret human behaviour in terms of the meanings assigned to it by the actors themselves" (p. 214). This humanising of reality was a significant factor in selecting in-depth illustrative case studies as an approach to ethnography so as to keep the human participant front, centre and visible to the interpretations and presentation of findings in this study.

Interpretation through Language

This thesis undertakes a qualitative methodology to answer research questions that are primarily interested in exploring how reality is experienced (Rossman & Wilsom, 1985), so as not to reduce the LL to solely numbers. The focus of qualitative methodology is trustworthiness, transferability and credibility and is typically narrative where researchers use combinations of interviews, observations and document analysis (Teddlie &Tashakkori, 2008). The approach to understanding the *how* and with *whom* of the LL and the meanings people assign to LL artefacts in this study was predominantly dependent on the use of language, through semi-structured interviews that were audio recorded, later transcribed, analysed and interpreted by the research and presented as in-depth case studies.

Language for all participants is constructed through social and historical frames of reference, such as Townsend's (1985) "reality map", which in this context can be likened to Doolittle's (2014) "schema" or "existing internal models" described in more detail in Complex-Constructivism section below. Both the researcher and participants have their own reality maps, and using the definition of proximal processes, these interactions involving interviewing, listening, analysing and interpreting are bidirectional and mutually influential. Language is filtered through perception, through narrative choices and influenced by context and social reality (Brodkey, 1987). One person's account of an event may never really encapsulate the multi-layered complexity of the event. As language is filtered through the frame of the user and passed from the researched to the researcher, the researcher's retelling through either interpretation or analysis involves yet another reduction of reality (Brodkey, 1987).

In an interpretative analysis, as opposed to content analysis, the researcher seeks to understand the data from the perspective of the researched and acknowledges the existence of a person's "reality map". In these situations, analysis beyond the limitations of language may be necessary by acknowledging that language is an interpretation by the researcher. Acknowledging the researcher's interpretation was supported by using direct verbatim quotes from participants as illustrations in the findings chapter. Denzin and Lincoln (2005) argue that a qualitative approach to research is fundamentally interpretative and the approach to all phases of research is guided by the researcher's beliefs and feelings about the world. The effect the researcher has on the research situation is immeasurable (Brodkey, 1987), but a strength of qualitative research is that it is openly acknowledged. Walsh (1996) identifies the problem of unconsciousness in qualitative research, he suggests a high degree of reflexivity is needed in qualitative research to illuminate the frames of reference of both researched and researcher, which creates added complexity. Given this added complexity, the Complex-Constructivism theory was blended with the Interpretivist perspective to acknowledge the complexity and fluidity of interpretation from multiple perspectives, particularly of the researcher as a learner, and to justify the selection of validity procedures described later in this chapter.

Complex-Constructivism

Complex-Constructivism (Doolittle, 2014) draws together the learning theory constructivism (for example, Vygotsky's Social Constructivism, 1978) and the broad-based theory of complexity. This blending the theoretical underpinning of the research paradigm in this study and Complex-Constructivism aims to expand the understanding of social constructivism. Complex-Constructivism "views learning as the active construction and adaptation of one's internal models of reality based on the interaction between oneself and one's environment (including other persons), such that the functioning of one's internal models exceeds the sum of the models' components" (Doolittle, 2014, p. 1). Complex-Constructivism within the blended research paradigm plays a number of roles in this thesis. It is applied to the research design to frame the evolving nature of the methodology, as the methodology was actively constructed and adapted based on the interactions with participants and their environments in this study. Complex-Constructivism is a lens in the analysis and presentation of findings, to focus on the nature of interacting elements within a whole and the selection of case study design with multiple perspectives. Finally, Complex-Constructivism is used to position the researcher as a learner to acknowledge that this thesis is the active construction and adaption of the researcher's internal models of reality based on the interaction between the researcher and the research participant within the educational setting environment.

Complex-Constructivism as a Lens

Complexity theory views an entire system consisting of dynamic interacting parts that are emergent in nature and transformational (Mason, 2008). Phenomena in complexity theory "must be regarded, simultaneously, as collectives, unities and subsystems" (Sumara & Davis, 1997, p. 302). Morrison (2008) suggests, "In addressing holism, complexity theory suggests the need for case study methodology, qualitative research and participatory, multi-perspectival and collaborative (self-organized), partnership-based forms of research, premised on interactionist, qualitative and interpretive accounts (e.g., Lewin & Regine, 2000)" (Morrison, 2008, p. 25). This complexity-based alternative perspective to understanding the whole, requires understanding both the whole and the interaction of its parts (Cilliers, 1998; Lewin, 1993). Interactions are a significant component of collective understanding and involve "consideration, judgment, listening, all of which are located among and between individuals interacting" (Pratt, 2008 p. 124). The complexity lens in this thesis is placed on the "relationship between elements, rather than the elements themselves" (Morrison, 2008, p. 21). Figure 4.1 illustrates the interactions between elements that are of primary interest in a

complexity-based perspective towards understanding the whole with the red lines, for example, representing VLL mediated proximal processes between caregiver and educator.

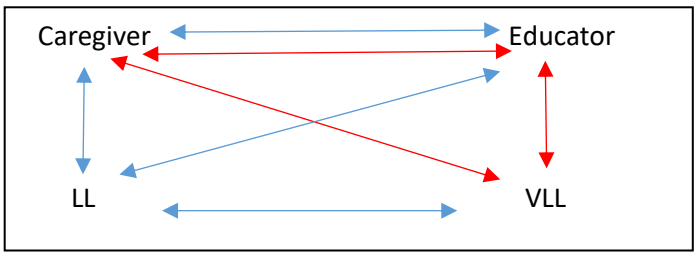

Figure 4.1: Illustration of the interactions between elements that are of primary interest in a complexity-based perspective towards understanding the whole with the red lines, for example, representing VLL mediated proximal processes between caregiver and educator.

The initial relationships of interest in this thesis are the interactions between the caregiver, educator, the LL and the VLL (Figure 4.1). Illustrating the complex interactions and relationships between the elements, framed by the conceptual framework, enables the exploration of the power, direction, form and content of the proximal processes as outlined in the ethical considerations earlier. Proximal processes can shift and modify, such as the inclusion of minority language shifts the content of these interactions that may reposition the power and direction of proximal processes for the minority language speaker. The artefacts within the LL and VLL can mediate such interactions, as the form of proximal processes shifts from direct interaction to meditated interaction with physical and virtual symbols.

Complex- Constructivism to Position the Researcher as a Learner

The Complex-Constructivism definition combines constructivism with adaptation and takes into particular account the interaction between the person and their environment and role of the learner's internal models. The role of the researcher (student) is to describe the participant's experiences of the LL of the educational setting based on what Doolittle (2014) terms as an interaction with "existing internal models and the environment". In the following extract, Doolittle's description of the learning process highlights how Complex-Constructivism can be applied to the researcher's interpretation of the participant's experience.

> Students enter an experience with existing internal (mental) models, or schemas, that allow the student to predict how the experience may transpire, to prescribe desired behaviours based on the predictions, and to describe the experience as it occurs. However, students with limited existing internal models related to the current experience will have only a limited ability to predict, prescribe, and describe, while students with more well developed internal models will be able to predict, prescribe, and describe more effectively. (Doolittle, 2014, p. 494)

In this description, this Complex-Constructivism perspective reinforces the existence and influence of the researcher's schema and frames of reference. This extract adds depth to conceptualising Complex-Constructivism within the research paradigm, in that the ability to describe the experience as it occurred in this study is an interaction with the researcher's existing models. As such, it is important to acknowledge openly the researcher as a learner in this study. Acknowledgement is viewed through Doolittle's six Complex-Constructivism principles (Doolittle, 2014, p. 494) and positions the researcher as a learner.

- Learning involves an individual's adaptation to the environment.
- Learning involves the active construction of knowledge by the individual.
- Learning involves the self-organization of knowledge and experience into internal model.
- Learning involves the emergence of internal models as a natural consequence of an individual's ongoing experience.
- Learning is a function of both individual interaction and existing internal models.
- Learning occurs within agent hierarchies and selection pressures that includes individuals, family, friends, and local and global culture.

Complex-Constructivism is a theory influencing the research paradigm, in particular the learning principles that relate to of the construction of knowledge in this study and the processes of interaction between the participant and the researcher as a learner. As stated earlier, the focus of this study is not on language acquisition itself. Doolittle's (2014) six general principles of learning based on Complex-Constructivist ideals are utilised to add further considerations for the research paradigm. However, as this study evolves, the general principles may have relevance for emergent bilingual young children and the social constraints, structures and ideologies reflected in LLs of their educational settings. However, the perspective of this study remains that of the educators and caregivers of emergent bilingual young children as experts. The primary purpose of outlining the

Complex-Constructivism principles was to frame the construction of knowledge and position the researcher as a learner, which deepens the conceptualisation of this research paradigm. In addition, the outlining of the blended Interpretivist and Complex-Constructivist research paradigm assisted in selecting the processes for seeking validity.

Seeking Validity

Creswell and Miller (2000) argue that seeking validity can have multiple perspectives and that selection of validity procedures "is governed by two perspectives: the lens researchers choose to validate their studies and researchers' paradigm assumptions" (p. 124). In this study, the selection of validity procedures were based on Creswell and Miller's framework. Three distinct lenses the researchers can choose are the *lens of the researcher*, the *lens of the study participants* or the *lens of people external to the study*. The validity procedures in this study were of the *Constructivist (Interpretivist) Paradigm* assuming the *lens of the participants and researcher.* Taking this position and lens, the primary procedures for seeking validity are therefore, prolonged engagement in the field and disconfirming evidence.

Creswell and Miller (2000) argue that the development of relationships and reciprocal interaction increases the validity and reliability of authentic participant accounts given. This involves relationship building, establishing rapport and building trust. In particular, strong research validity and vitality stems from engaging with participants daily and over long periods of time (Fetterman, 1989). The development of relationships in this study is seen as the mechanism for undertaking prolonged engagement in the field. Figure 4.2 illustrates an example of a reciprocal engagement timeline beginning with the first email contact and spanning over four years. Figure 4.2 is based on one mainstream ECE centre and used as an example to demonstrate prolonged engagement with Kaupapa Māori informed practices as a validity procedure. In this example, the collection of data was around one year, but the nature of reciprocity meant that the relationship remained ongoing with participants and included a variety of forms of researcher involvement that continued in 2020.

	June	July	August	September	October	November	December
2016	Launch of community Hub – ABS team, community members and educators attend.		Community meeting with follow up email contact to participate	Phase One - Interviews and data collection	Compiled video - ECE request to share on website and e-portfolio dashboard	ECE centre LL workshop with ECE team facilitated by Study 3 team	
2017	Community workshop on raising children with two languages presented by Study 3	Submit Phase - One Linguistic Landscape report to ECE for review	Meeting with ECE head teacher to feedback on phase one LL report	Phase Two - Interviews and data collection	Literacy and Learning Symposium, ECE Head teacher attends and speaks alongside Study 3 team to audience of community educators	Send reviewed phase one report to the Head office of ECE	Phase one and two full report submitted to ECE for review. Attended ECE centre gathering as a member of the ECE community.
2018	Ongoing engagement to seek permission for publications, workshop invitations, and feeding back research findings and literature of interest.						
2019							

Figure 4.2: Example of reciprocal engagement timeline beginning with first email contact and spanning over four years.

In one example above, after Phase One LL data collection, the video data was edited into a short video presentation (October 2016) as a visual expression of the interview themes with written extracts from the interview undertaken with the Head of the centre. This video was then shared back to the participants as a presentation of their LL during a meeting with their teaching team (November 2016). This preliminary analysis of the centre shared back to educator participants acted as an additional validity check of the data as the video was subjected to feedback and comments from the participants. No modifications or adjustments were made to the video prior to being shared electronically via the ECC's e-portfolio dashboard by the *Early Childhood Centre* (ECC), a dashboard accessible to ECC caregivers.

A linguistic landscape report was produced for the ECC in July 2017, to verify early findings and for the centre to use for their own purposes, such as an annual review and future planning. In addition, expert researchers, that were a part of my then supervisory team, then reviewed and validated the evidence for each theme by applying their expertise in *Early Childhood Education* (ECE), linguistics, and/or the virtual environment. This LL report was offered to participants, both the ECC and the ECC organisation head office, with opportunities to feedback and review (July, July, August, November and December 2017). Any dissemination and publication of data from the research was submitted for review to the ECC Head of Centre prior to any publication or public presentation. This range of engagement strategies outlined in Figure 4.2 also added strength to the ability to uncover any conflicting discourse.

The incorporation of visual data and the development of reciprocal relationships built a richer, more illustrative description of the data as a means to strengthen the validity of the findings.

Disconfirming Evidence

Disconfirming evidence took the form of finding conflicting discourses within narratives (Antin et al., 2015). Typically, this occurs at the end of the study (Booth et al., 2013) in order to refine themes to represent the philosophical ideas. In their qualitative study, Antin et al. (2015) incorporated researcher field notes, research memos, and triangulation of interview narratives elicited by using multimodal techniques in order to uncover "the multidimensional nature of a particular phenomena" (p. 8) when findings conflict to disconfirm evidence. To disconfirm evidence in this study a multimodal approach was used in the data collection, in the form of visual evidence, participant interviews, researcher field notes, research memos and accessing associated documents. Further detail regarding the reciprocal engagement and methods for prolonged engagement and disconfirming evidence in this study are described in Chapter Five Methods.

Ethnography

Ethnography was selected as an overarching methodology and approach to this study given the ethical considerations and research context. The intention of undertaking ethnographic methods was to understand the people and their lived experiences within the educational settings. Saule (2002) describes ethnographers as researchers who are interested in "the study of people within their everyday contexts" (p. 180). Ethnography lends itself to prolonged engagement in the field and is a procedure most suited for seeking validity, based on Creswell and Miller's (2000) framework from the Interpretivist paradigm and assuming the lens of the participant. Though this study employs a general ethnographic approach guided by Mills and Morton's (2013) three broad principles for ethnographic research in education, it is informed by elements of linguistic ethnography (Copland et al., 2015). In particular, a lens on "how language is used by people and what this can tell about the wider social constraints, structures and ideologies" (Copland et al., 2015, p. 27). To bring out the full descriptive and explanatory potential of LL research, Blommaert (2013) argues for "microscopic and detailed investigation of cases – ethnography, in other words - as perhaps the most immediately useful methodology for investigating systemic sociolinguist aspects" (p. 13). Ethnography tends to be non-

linear; elements of research are often interwoven, adapted and the development of one element influences the development of another element (Saule, 2002). The overall objective of the research in this thesis is not so much in finding a singular "truth", but the construction of knowledge that results from the interaction between the researched and the researcher in keeping with an Interpretivist and Complex-Constructivist theoretical positioning.

Mills and Morton (2013) contend that previous certainties in education, such as policy verses practice, are being replaced by "complexity, ambiguity and fluidity". They argue that ethnography, through communicating the stories that matter, enables researchers to follow such changes. The writing process becomes an integral aspect of the method and it is considered a strength of the ethnographic approach. Common methods in ethnographic research include observations, participant interviews and document analysis with findings presented as narratives through stories, vignettes or portraits. In this thesis, I undertook ethnographic methods, namely semi-structured interviews, a researcher's journal, observational photographic data of the LL and screenshots of the VLL associated with the educational settings and outlined in more detail in the following Methods chapter. Mills and Morton (2013) state three broad principles that orient their approach to ethnography in educational research. These three broad principles also orient the ethnographic methodology undertaken in this thesis (Mills & Morton, 2013, Chapter 1, p. 4).

- ethnography as a way of being, seeing, thinking and writing
- ethnographic work should aim to be an 'uncomfortable science' (Firth 1951), an approach to research that is a little unconventional, a little exposed
- ethnography demands empathy

The ongoing nature of the writing process associated to the ethnographic approach highlights the unique aspect of ethnography, in which data analysis occurs throughout the study rather than being left until the end (Williamson, 2006, p. 87). For example, ethnographic field notes collated in a researcher's journal are a part of the interpretive and reflective processes. My own researcher's journal is described in more detail in the Methods section of this chapter. In addition, I consider the formal and informal dissemination of data as a part of the larger project and reflective writing process.

Walsh (1996) suggests unconsciousness may interfere with the reflexivity of the researcher, as reflexivity is about the researcher bringing awareness to assumptions in relation to the participant's experience that may be taken for granted. Interpretive qualitative research requires some form of

relationship between the researched and the researcher and can range in intensity from ethnographic studies through to outsider observations. My role of the ethnographer within the educational context and was somewhat bi-directional, as in order to observe and understand, I in some way influenced the context. My presence, from a Complex-Constructivist perspective, then became influential and bi-directional. The commonly noted occurrence of influence across all settings, as noted in the researcher's journal, was that the term 'linguistic landscape' used to describe the visibility of languages within the educational settings was a new term for educators to use. The term seemingly increased educators' awareness of the presence and value of diverse languages due to my interest in the LL for educational research.

A strength of qualitative ethnographic research is that it acknowledges the impact of researcher involvement; this includes the quality of relationship building, the researcher's capability to empathise and develop the ability for deep listening and feeling the stories to enrich representation in qualitative studies (Gair, 2012). Although the concept empathy is difficult to define, Stein (1989) suggests deep listening through common humanity, rather than needing a shared experience to emphasize. This definition of empathy aligns with the research paradigm and ethical considerations previously outlined in the Kaupapa Māori practices section above, as these practices shaped and develop the nature of the relationship between the researcher and participants. The relationship with the participants remained central to the research practices within the participant's own context. This alignment further substantiates the selection of ethnography in this study and the selection of in-depth case study as an approach within an ethnographic methodological approach.

In-depth Illustrative Case Study as an Approach within Ethnography

This thesis uses qualitative case study as a method to understand how the LLs support the presence and use of minority languages in the educational settings of 4 to 6-year-old emergent bilingual young children. Yin (2003) provides a technical definition of a case study as one that "Investigates a contemporary phenomenon in its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (p. 13).

A case study as an approach has an interpretative base (Mutch, 2005; van Manen, 1990), which aligns with the research paradigm already presented in this chapter. It relies on thick descriptions from

participants, which the researcher then relays in order to explore the deeper meanings behind what is being studied (van Manen, 1990, p. 178).

> Case study research excels at bringing us to an understanding of a complex issue or subject and can extend experience or add strength to what is already known through previous research. In contrast, case studies can also emphasize detailed contextual analysis of a limited number of events or conditions and their relationships. (Grauer, 2012, p. 70)

Adding rich illustrations to the qualitative data is to offer the reader the opportunity to experience, or think that they would be able to experience, the situation or setting being described. This aims to provide as much detail as possible to illustrate a small slice of interaction whilst locating individuals in the specific situation (Denzin, 1989). The locating of participants in this study is within the LL of educational settings. In order to provide the fullest description of the LL of the educational settings, the incorporation of photos in the findings is to provide the fullest level of vivid detail of the LL of each setting, which extends the capacity that a written description can offer. Along with increasing the credibility of the research with illustrations, it also provides detail to the reader to make decisions about the transferability of the findings to their own or similar contexts or settings.

The approach to case studies in this thesis was in-depth and illustrative. Hayes, Kyer and Weber (2015) suggest that illustrative case studies "should describe every element involved in a case (the location, people involved, their goals, what they do, etc.) in a way that remains entirely accurate while still focusing on language that will be understandable by the target audience" (p. 8). An important purpose of the illustrative case study is to "bridge the gap in the understanding of a topic between the researcher and the target audience" (p. 8), with visually descriptive data. Presentation of data consists of "self-contained descriptions of what the researcher observed and narratives about how the individual people or other elements involved in the situation acted during the length of the study" (p. 9) with additional explanation of more complex information. Additional recommendations are that an illustrative case study approach should remain small where results are not generalizable or made to span across cases. This approach is particularly suited to informing the audience of a situation in its early stage of development. Hayes, Kyer and Weber recommend selecting data collection sites that provide useful descriptions that are either typical or representative.

Case Study Selection

As outlined earlier in the Preface, this thesis is set within a broad ethnographic study of the LLs of twelve educational settings of emergent bilingual young children. From these twelve educational settings, a series of three in-depth case studies of three educational settings were purposefully selected. Purposeful selection of in-depth case study was based on the cases' richness of data related to issues of central importance to the purpose of answering the main research questions, as recommended by Patton (1990). Selection of case studies aimed at ensuring variation between cases across the immersion, mainstream ECC and primary school settings, as well as ethnic diversity amongst the 4 to 6-year-old children in this study. The three selected cases only give somewhat of a representative range across the educational settings; however, findings are not intended to be generalisable. Limiting the selection of cases also enabled detailed description of each case that retains the qualities of person characteristics in relation to the context within which the proximal processes were occurring. The elements of the case study, as they fit with the conceptual framework, are outlined in more detail in the Methods Chapter.

The three in-depth case studies in this study

1. A case study of LLs (physical and virtual) experienced by emergent bilingual 4 to 6-year-olds who attend a **mainstream primary school (PM1)** in an inner-city suburb of Aotearoa New Zealand. This case study is limited to 2016 and 2017 and contains only the public accessibly view and views of participating primary educators and two caregivers.
2. A case study of LLs (physical and virtual) experienced by emergent bilingual 4 to 6-year-olds who attends a **mainstream ECC (CM2)** in an inner-city suburb of Aotearoa New Zealand. This case study is limited to 2017 and 2018 and contains only the public accessibly view and views of participating ECE educators and two caregivers.
3. A case study of LLs (physical and virtual) experienced by Samoan emergent bilingual 4 to 6-year-olds who attend a **Samoan immersion ECC (CS3)** in an inner-city suburb of Aotearoa New Zealand. This case study is limited to 2016 and 2017 and contains only the public accessibly view and views of participating ECE educators and two caregivers.

The three in-depth case studies are presented in the Findings, Chapter Six. Examples of the relational links aims to illustrate the proximal processes that support the presence and use of minority languages through artefacts demonstrates the variation of educational settings-based cases in this study. How

this was achieved is described in the Material and Methods, Chapter Five, in the in-depth illustrative case study analysis section.

Summary

In this Methodology chapter, I have outlined the ethical considerations for this thesis that have shaped the research paradigm and guided the methodological design of this study. As a non-Māori researcher, I adopted Kaupapa Māori research practices to inform my Relationship Perspective, with reciprocity as a theme, to my ethical considerations. A Relationship Perspective aimed to address power relationships, participant safety and to ensure this research contributed to better outcomes for Māori, as well as better outcomes for other emergent bilingual young children with minority languages and cultures. These ethical considerations then guided the methodological decisions in a way that were responsive to the participants and the context of the thesis. The overarching methodology of this thesis was qualitative ethnography, guided by the three broad ethnography principles of Mills and Morton (2013) from an educational perspective. The researcher's role was to listen deeply with empathy, socially construct meaning with the participants, and empower participants by positioning them as the experts and knowledge generators. An in-depth illustrative case study approach enabled exploring how the LL was experienced using ethnographic data collection methods, namely semi-structured interviews, a researcher's journal, observational photographic data of the LL and screenshots of the VLL associated with the educational settings that are described in more detail in the next chapter, Chapter Five.

5. Methods

This chapter outlines the methods used in this ethnographic study of *the linguistic landscapes* (LL) experienced by emergent bilingual young children. This study adopted typical data collection methods found in LL research, collecting and interpreting digital photos of signs (Gorter, 2016), and expands on these methods in a number of ways by incorporating the *virtual linguistic landscape* (VLL) and the home environment associated to the educational settings. The methods follow those undertaken in Harris (2017); an ethnographic case study of an award winning Māori immersion early childhood centre. In line with the qualitative approach and research paradigm of Interpretivism and Complex-Constructivism, analysis of the findings is through the application of the Bioecological Systems Framework to explore how the LL is experienced. Thus, the methods were designed not just to quantify the LL, but also to understand how the LL is experienced and accounted for by the participants through their interactions within the environment (both physical and virtual).

The aim of this thesis is to illustrate the LLs (physical and virtual) of emergent bilingual 4 to 6-year-olds in New Zealand. The environments of interest are the educational setting, home environment and the virtual environments accessed via *digital technology* (DT), including digital screen media, television and computer screens. This illustration of the LL is viewed through a Bioecological Systems Framework (Bronfenbrenner, 2001); in particular the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). As outlined in the Methodology chapter, three educational settings and findings are presented as in-depth illustrative case studies. These case studies were selected as in-depth cases studies from LL data collected from twelve educational settings that participated in the "Emergent Bilinguals in a Digital World" Study Three (Gillon et al., 2019) within A Better Start Successful Literacy and Learning project (see Preface). The overarching research question of this present study is: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? This chapter is organised in three sections, a description of the participants and timeline, the data collection methods and materials, and the analysis of data to produce the three in-depth illustrative case studies presented in Chapter 6a to 6c. The three case studies are; one immersion ECC, one mainstream ECC and one mainstream primary school, in order to illustrate the proximal processes that support the presence and use of minority languages in the educational setting of emergent bilingual young children.

Participants

Kaupapa Māori practices informed this research methodology. These practices were taking time to form relationships with the participants, remaining visible throughout the data collection, and engaging in informal conversations before capturing the LL and conducting formal interviews. People of interest in this study were the educators and caregivers. Children were not included in observations or direct data collection methods, instead adults described emergent bilingual young children's experiences of the LLs of the educational setting, home environment and the virtual environments as accessed through DT. Interviews were conducted within most educational settings, with the Centre Manager/Head Teacher/Lead Teacher, two educators and two caregivers, either with the individual or in a small group. The educational settings in this study included early childhood education providers and a primary school located in the target community identified for the larger research project. The communication and development of relationships began with an information meeting with Ministry of Education facilitators, stakeholders and community members in mid-2016, introducing them to the Successful Learning theme of A Better Start (Gillon et al., 2019). Early community engagement enabled participants to be involved in the design process of the LL research associated to this study, through consultation for the larger project. The project team members continued engagement with associated community workshops and events.

Recruitment Process

Initial email contact was made with 11 ECE centres (in 2016) and seven primary schools (in 2017) who had expressed interest in participating in A Better Start Successful Literacy and Learning project. The Successful Literacy and Learning project was situated within three suburbs of a large city purposefully selected because of its cultural diversity and over-representation of low-income families. Twelve educational settings (seven ECC and five primary) responded to this email request and agreed to recruitment of participants for participation in the "Emergent Bilinguals in a Digital World" Study Three (Gillon et al., 2019) within A Better Start Successful Literacy and Learning Project, of which the three in-depth case studies in this thesis were included. Contact with the Head and/or Lead teacher was made to arrange interviews and to identify potential caregivers interested in being interviewed. The Head or Lead Teacher approached educators within their settings face-to-face regarding their interest in participation. Caregiver selection was generally based on the Head or Lead Teacher's knowledge of the attending caregivers, their availability and their possible willingness to participate in the research. Although caregivers of emerging bilinguals with heritage/home languages other than

English were preferred, availability and willingness to participate were the main reasons for selection. All participation was voluntary and Head Teachers committed to advising the researcher, ensuring that caregivers and children who did not wish to participate were not inconvenienced. In most educational settings two caregivers, two educators and one Head and/or lead participated. Of the twelve educational settings in this research, five were unable to recruit caregivers to participate in the research. Table 5.1 outlines the number of adults interviewed over the data collection period from 2016 to 2018 (the total from all those participating in all seven ECC and five primary schools). Information sheets and consent forms were provided to the participant, ECE organisation leaders, principals and the Board of Trustees.

Table 5.1

Number of adults interviewed over the data collection period from 2016 to 2018 (the total from all those participating in all seven ECC and five primary schools).

	2016	**2017**	**2018**	**Total number interviewed**
(Number of adults interviewed in all 7 ECC)	(22T +6P)	(14T +1L +1P)	(1L)	(33T +2L +7P)
(Number of adults interviewed in all 5 primary schools)	(0)	(8T +1L +2P)	(17T +1P +1L)	(25T +2L +4P)

Key: T: Teachers including HOC; P: caregivers or other family members; L: librarian (two in total).

In phase two of data collection, approximately one year later; only one interview was undertaken within each educational setting with, in most cases the Head/Lead teacher. The decision to undertake just one interview was in consideration of limiting the time and burden placed on the Head Teachers needing to arrange additional interviews with both educators and caregivers.

Timeline

Two phases of data collection of LLs of educational settings were completed over the period from 2016 to 2018. Figure 5.1 illustrates the timeline of data collection for phase one (orange circles) and

two (yellow circles) for ECE and primary schools with a representation of the general spread of data collection in educational settings. The two phases, with approximately one year between each phase was in consideration of the Chronosystem of the Bioecological Systems Framework and the element of time. Each phase consisted of four methods of data collection of the LL, observational photographic data, semi-structured interviews, collection of secondary documents and a researcher's journal.

The photographic evidence of the LL were digital photos and screenshots of the VLL, with the use of video to aid in identifying the position and proportion of photographic data within the educational settings. Data collection and interviews with educators generally occurred on the same day.

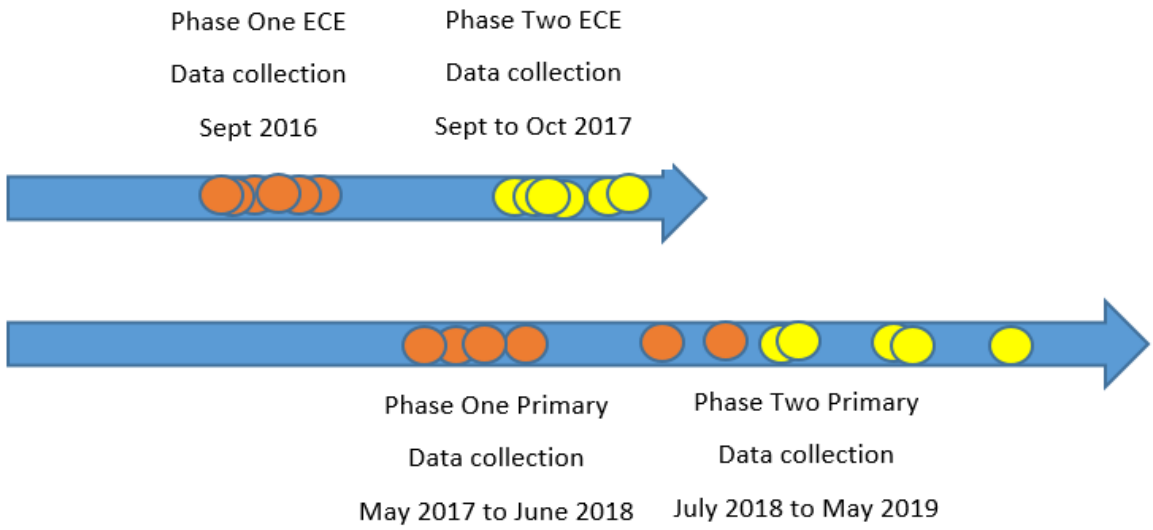

Figure 5.1 Timeline of data collection for phase one (orange circles) and two (yellow circles) for ECE and primary schools with a representation of the general spread of data collection in educational settings.

Data Collection Methods and Materials

In this section, the data collection methods are described as they were used in this thesis. The educational setting and home environment were selected as the child's microsystems of interest and are illustrated as interconnected in Figure 5.2. An additional consideration was the virtual environments, defined here as the online environments accessed through DT, in particular those

associated to the educational setting. It is important to note that LL data was not directly observed within the home environment.

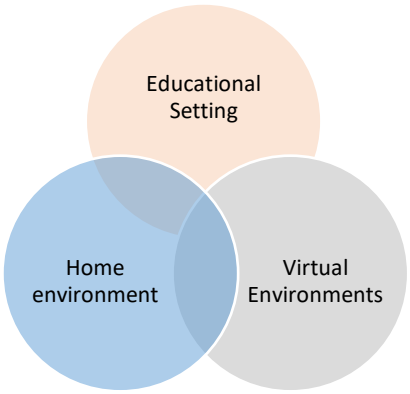

Figure 5.2: The three interconnected environments of interest in this present study.

To answer the research questions LL data collection methods in this thesis were primarily digital photos, semi-structured interviews with caregivers and educators and the incorporation of screenshots of publicly available online pages associated to the educational settings. Screenshots were used as a method for collecting data from the VLL. However, there were limitations on capturing the dynamic nature of the online spaces and the extensive hyperlinks. Data collection also included the consideration of secondary documents associated to educational settings and a researcher's journal.

Observational Photographic Data of the Linguistic Landscape

The ethnographic observation data for each LL of the educational setting consisted of photographic images in the form of still pictures, videos, and online screenshots. Still pictures and two videos taken at both child and adult height captured the displays on the walls within each educational setting. VLL data was gathered in the form of screenshots of publicly accessible web pages associated to the educational setting and used to support interviews with educators and caregivers. LL data collection included videos of the walls around the circumference of the centre, photos of individual displays, photos of items of technology within the teaching space, screenshots of the online presence of the educational setting. How these methods of data contribute to the LL data and findings is described under each heading below. The collection of the LL was an inductive approach that, without any previous conversations with any of the research participants or prior knowledge of the educational setting, photographs were taken to capture the displays on the walls.

Videos - The first video was at adult head height, and then the second video was taken at a child's head height. The two videos aimed to capture the perspectives of LL of both adults and children. Each video began and ended outside the main entrance of the educational setting. Videos excluded areas that were not accessible to children or areas considered private, such as bathroom areas or personal office spaces. The purpose of the video was to allow for a three dimensional record of the educational setting which allowed the opportunity to take screenshots of artefacts of interests and to assist in orientating the position and proportion of displays in relation to one another. Data collection needed to respond to the availability of the participants and their corresponding approval as to whether it was acceptable to gather LL data during class time. Videos during class time excluded any filming of children. This was achieved by filming around or above children. The video also simultaneously collected the audio within the space. This audio was not used for linguistic analysis, but contributed to the impression and ambience of the setting, which was noted in the researcher's journal.

Photos - A digital photo was then taken of each display in the educational setting. For larger displays, a photo of the entire display was taken and then part or parts were taken closer up. The criteria used to select which part of the larger display was captured was decided spontaneously and was based on personal perception of what items were most representative of the larger display. All displays were included in the data. Also included in data collection was any symbol or object of cultural aesthetic as well as any technological device visible in the educational setting. No photos were taken or used from within the family participant's home.

Screenshots - Screenshots were taken of webpages associated to the educational setting, which were located through typing the name of the educational setting into the search engine Google. These screenshots were considered the VLL associated with the educational settings. Educational setting websites, webpages, social media accounts and public information online was considered VLL of the educational setting. This research did not include screenshots of private communication, for example, emails and text messages, nor did it include any data gathered directly from DT devices within the educational settings. Instead, participants were asked to describe the type of applications and interactions mediated by DT that included the presence and use of minority languages. Therefore, data collection of the VLL included both observational evidence (screenshots) and interview data relating to the children's interactions with DT.

Semi-structured Interviews

Interviews were designed to elicit descriptions from adults around the LL of the educational setting and home environment and associated language and DT interactions to understand the proximal processes and mesosystem interactions from their perspective as caregivers and educators of emergent bilingual young children. Artefacts from the LL were used to discuss the educational setting's language and digital technology policies and practices, and to identify the educational setting's engagement with families and the communities that supported the language development of its emergent bilingual children. The interviews elicited reflections on adults' practices with emergent bilinguals and prompted ideas for future strategies. The duration of the interviews was no longer than one hour. As interviews were not conducted within the homes of caregivers, data gathered on the LL of the home was based on the participant describing the LL and VLL. Through this conversational approach, both the interviewee and the interviewer highlighted particular artefacts from the preceding data collection as they related to emergent bilinguals growing up in Aotearoa New Zealand.

The interviews were semi-structured and maintained a conversational quality that allowed both the interviewee and interviewer to co-construct understanding of the language and digital technology policies and practices as they related to the displays on the walls. Guiding questions were around language and digital technology policies and practices to support the language development of their emergent bilinguals (See Appendix 1). The emergence of additional questions was predominantly to further understand the participants' narrative, experiences and explanations of the physical and virtual artefacts. Interviews with both educators and caregivers were conducted either individually or in small groups, depending on the availability and preference of the participants. All interviews with caregivers in the three in-depth case studies were conducted at their educational setting. Guiding interview questions were based on Harris (2017) in addition to more mature research questions that had developed from incorporating the elements of the conceptual framework detailed in Chapter Two.

Associated Documentation

Secondary data associated to the educational setting was identified in interviews and either accessed online or received from interview participants directly. Secondary data included the Ministry of Education's Early Childhood Curriculum document *Te Whāriki*, ECC and primary school reports from

the Education Review Office (ERO), self-appraisal documentation and information from the community groups that contributed to the LL of the child, such as the community library and outreach librarian. Selected documents were reviewed for relevant policies and guidance for the presence and use of minority languages and referenced if particular aspects were associated to and/or influential on their practices. This secondary documentation is presented in the introduction of each case study in the findings chapter as they relate to each ECC, primary and immersion educational setting.

Researcher Journal

Ethnographic field notes collated in a researcher's journal were an ongoing informal analysis of the research data as it was being undertaken, interwoven with researcher reflexivity. The concept of reflexivity was guided by Mills and Morton's (2013) understanding for what they referred to earlier in the three broad ethnographic principles as "an uncomfortable science" as coined by Firth (1951). For Mills and Morton, this means the researcher being 'at risk' means being exposed to the profound complexities of the social and educational worlds of which ethnographic researchers are a part. It involves questioning the things others take for granted, making the familiar strange, not jumping to conclusions" (p. 4). The style of writing in the researcher journal enriched the physical data by incorporating additional interpretations, impressions and experience of the environment that was sensory.

Analysis of Data

From the broad ethnographic study of 12 educational settings, three educational settings were purposefully selected for this thesis. The presentation and analysis of the three in-depth case studies aims to reflect explicitly the application of the Bioecological Systems Framework, in particular the PPCT model and associated mediated artefacts from the LL. Each in-depth illustrated case study is presented in order of the research questions relating to the LL, the microsystems, the mesosystems and the LL after approximately one year. The presentation of findings is in order to answer the overarching research question. In addition to the PPCT model, artefacts from the LL are included in each case study, interwoven with interview data. Overall, the in-depth case study approach aims to illustrate the proximal processes and development of relationships mediated by the LL of educational settings in order to answer the research questions. Descriptions of proximal processes include the power, direction, content and from of the proximal processes and the demand, resource, and force of

person characteristics. Therefore, the Bioecological Systems Framework is applied to the analysis of the case studies in the following way.

1. Each case study aims to focus on the relevant proximal processes that are hypothesized to be involved in the development of the presence and use of minority language.

2. Each case study aims to understand the ways person characteristics, in particular their language resource characteristic which may vary from emergent to fluent, that influence those proximal processes.

3. Each case study aims to understand the ways context, one mainstream primary (PM1), one mainstream ECC (CM2), and one Samoan immersion ECC (CS3), influences proximal processes.

4. Each case study aims to illustrate any developmental change in the LL after approximately one year.

Linguistic Landscape Analysis

The photos of displays, a representative part of larger display and online screenshots were classified as either containing linguistic content, no linguistic content but containing a cultural image or symbol, or no linguistic content or cultural image or symbol. The photos containing linguistic items were then coded in relation to the languages used in the display, the permanence of the item, either temporary or permanent, the publisher of the display, if the display was static or dynamic, the location of the display, the medium used and the height of the display. Cultural images or symbols were counted as a cultural item but not coded. From this coding, a second selection was made of artefacts of interest for analysis that could be referenced to the interviews. This coding analysis was not undertaken for screenshots due to the limitations in accessing all VLL associated to the educational settings. An additional selection of artefacts for analysis was based on the participants' references to interacting with artefacts within the educational settings to ensure variation of artefacts across the three educational settings in this thesis.

Interview Data Analysis

Interviews were transcribed and analyses were both inductive and deductive to produce themes. Early analysis was based on deductive themes around policies and practices relating to language and digital media, which were identified through coding references to the use of digital technologies and/or

languages other than English. Inductive themes also emerged that could be categorised into themes based on the application of the Bioecological Systems Framework as a conceptual framework for this thesis. These themes were within the elements of the PPCT model, with the addition of a broad theme categorised by relationship, which Bronfenbrenner conceptualised as underlying the quality of proximal processes. Identification of proximal processes was based on the broad conceptualisation of proximal processes and is specified below as it was applied in this thesis.

> Regular direct and mediated interactions with linguistic landscape artefacts (physical and virtual) that support the presence and use of minority languages, and develop over time within the educational settings of the emergent bilingual young child.

In-depth Illustrative Case Study Analysis

Each in-depth illustrative case study (Table 5.2) is presented as consisting of two interacting microsystems (mesosystem) of the developing person, the educational setting and the home environment. The mesosystem is illustrated through interview extracts and images and the presentation of findings is structured using the Person, Process, Context and Time (PPCT) model. Table 5.2 gives an overview of the analysis of the three case studies applying the Bioecological Systems Framework with the PPCT model. Analysis primarily addressed interacting microsystems within the mesosystem, with proximal processes identified as interactions between the caregiver and the persons, objects and symbols in the LL of the educational setting. The element of time applied to the LL of the educational settings was to revisit the LL of the educational setting approximately one year to understand any developmental change. Other relevant chronosystem aspects of micro, meso and macro-time were incorporated into the associated person, process and contexts. Wider exosystem and macrosystem system influences are included as contexts identified by participants that influence the proximal processes under analysis.

All three in-depth illustrative case studies are structured in a similar way. Each case begins with an introduction and a description of participants interviewed from each microsystem, an illustration of the LL, the two microsystems; the educational setting and the home environment, the mesosystem of the developing person and concludes with an illustration of the LL after approximately one year. Each case focuses on relevant selected artefacts from the educational setting that illustrate development of presence and use of minority languages over time. Each case ends with a summary of the case and a conclusion.

Table 5.2

Overview of the analysis of the three case studies applying the Bio-ecological systems theory with PPCT and the concept of linguistic landscape with the development of selected artefacts over time in this present study.

PPCT		Case One (PM1)		Case Two (CM2)		Case three (CS3)	
		Primary	Home	ECC	Home	Immersion ECE	Home
Macrotime	Person - demand, resource, force; the person of interest with whom the developing person is interacting	Team Leader Y0/1 Studio	Parent of multilingual Chinese child	Head of Centre ECE	Parent of emergent bilingual Māori child	Centre Manager Immersion ECE	Parent of a bilingual Samoan child
Macrotime	Context - description of microsystem, language policies and practices and wider influencing contexts	NZ Curriculum, National Standards, Community of Learning, Additional Support	Grandparents, Chinese retail district, Community library, Sports groups	Te Whariki, Takaiako, Community connections	ECE centre, community neighbourhood	Te Whariki, Fausiga o le Faletel, Four Baskets of Cultural Leadership	Grandparents, Samoan church, Community library
Connecting Microsystems		↔	**Linguistic Landscapes**	↔	**Linguistic Landscapes**	↔	**Linguistic Landscapes**
Microtime	Processes - relational interactions and links with people, objects and symbols as framed by the Linguistic Landscape of the educational setting	Recording ethnic identity and languages, passing on e-portfolios, knowing children's DT experiences, parental concerns, connecting home and school		Engaging Caregivers, educating Caregivers, reading for language, Connecting via e-portfolio, limiting DT, including everyone, building deeper relationships, creating family, connecting with community, connecting with nature.		Choosing languages, sharing responsibility, educating caregivers, encouraging Samoan language at home, creating ambience, contributing and interconnecting	
Mesotime	Time - Selected artefacts showing development and change from first to second data collection over time one year later	2017 - → 2018 - 1. Multilingual Greetings → 2. SeeSaw e-portfolio		2016 → 2017 - 3. Nature Connection		2016 → 2017 4. Facebook	

Each microsystem is illustrated, drawing on the interview data and photographic data from the educational setting. The mesosystem, the interaction between microsystems, aims to illustrate the proximal processes seen to develop presence and use of minority languages within the educational setting.

Summary

This chapter has outlined the methods applied in this study, which were guided by the ethical considerations unique to undertaking research within a multilingual and multicultural context. The methods selected in this study were chosen in order to answer the overarching research question: How do the linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? Ethnographic data

collection of 12 educational settings from the larger project build on the methods and materials of Harris (2017). The environments of interest were the home environment, educational setting and the DTs that accessed the VLL associated with the educational setting. Methods included digital photos, videos, screenshots of VLL, semi-structured interviews with caregivers and educators in two phases of data collection. Three educational settings were purposefully selected for application of the Bioecological Systems Framework to produced in-depth illustrative case studies in order to answer the research questions. The three in-depth illustrative case studies are presented in Findings, chapters 6a to 6c.

6. Findings

This chapter presents findings in the form of *Three In-depth Illustrated Case Studies* of educational settings. The aim of this chapter is to illustrate the proximal processes mediated by the *linguistic landscape* (LL) that develop the presence and use of minority languages in the environments of emergent multilingual 4 to 6-year-old children, as reported by educators and caregivers in each case. Each in-depth illustrative ethnographic case study is interpreted through the Bioecological Systems Framework (Bronfenbrenner, 2005). The Bioecological Systems Framework is conceptualised using the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007) with contexts networked through direct and indirect social interactions. The microsystems in each case are the educational setting and the home environment of the emergent bilingual young child, interconnected using *digital technology* (DT) and the *virtual linguistic landscape* (VLL) associated with the educational setting. Mesosystem proximal processes of interest are between the child's educators and caregiver. Proximal processes are defined as relational interactions and links with people, objects and symbols. One or two artefacts selected for their relevance to bilingual children are illustrated in depth. The LL after approximately one year aims to illustrate change in the LL over time. These findings are in response to the overarching research question of this study: How do the linguistic landscapes of educational settings support presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand?

The Findings chapters are set out as follows,

- 6a Case One (PM1) - The educational setting and home environment of an emergent bilingual Chinese 5 to 6-year-old child
- 6b. Case Two (CM2) - The educational setting and home environment of an emergent bilingual 4 to 5-year-old Māori child
- 6c. Case Three (CS3) - The educational setting and home environment of an emergent bilingual Samoan 4 to 5-year-old child

The three in-depth illustrative case studies were purposely selected from the twelve participating educational settings in the broad study of Study Three (Harris et al., 2017a). The process of participant and case selection included inclusion criteria, such as the data from each case being complete and inclusive of educator and caregiver interviews. An additional inclusion criterion was to ensure a variation ethnic and language diversity between each case. The ethnic composition of the child in each

selected case represents the major ethnic minority groups in New Zealand; Māori, Asian and Pacific peoples (Statistics New Zealand, 2013).

The presentation of each case consists of,

- **An introduction to the educational setting**. This includes a description of the people participating in each case study and the networks associated to the people and their microsystems.
- **The illustration of the LL of the educational setting.** These illustrations follow a chronological format and begin with the first year visit.
- **The educational setting and proximal processes** that support the presence and use of minority languages and interactions with DT and the VLL.
- **The home environment and proximal processes** that support the presence and use of minority languages and interactions with DT and the VLL.
- **The mesosystem – caregiver and educator proximal processes** that support the presence and use of minority languages and interactions through DT and the VLL.
- **Time -** The illustration of the LL of the educational setting after one year including an overview of both microsystem (educational setting) and mesosystem proximal processes mediated by the LL (physical and virtual) of the educational setting.
- **Summary of the case.**
- **Conclusion.**

The order of in-depth illustrative case studies, parts A to C in this chapter, represents the increasing visibility of minority languages within the LLs of the educational settings. The primary classroom studio was observed to welcome minority languages, the ECC reflected the bicultural commitments of the Te Whāriki Early Childhood Curriculum document and the immersion ECE was rich in displays with Samoan language and culture. The findings from each case are intentionally presented without additional analysis to let the voice of each participant be heard within the contexts and artefacts the participants identified during the conversational style interviews. This aligns with the illustrative nature of the methodological approach. At times, the presentation of data shifts perspective, from the caregiver to the educator, between the micro and macro, and it is also intertwined to clarify interconnections and proximal processes within the environments of bilingual 4 to 6-year-olds. Further analysis of the findings is presented in the Discussion Chapter Seven with additional analysis as interpreted through the conceptual framework along with the discussion of the literature.

6a. Case One - Mainstream Primary Classroom Studio (PM1)

The educational setting and home environment of an emergent bilingual Chinese 5 to 6-year-old child

This is an in-depth illustrative ethnographic case study of the *linguistic landscape* (LL) of an emergent bilingual young child's educational setting interpreted through the Bioecological Systems Framework (Bronfenbrenner, 2005). The Bioecological Systems Framework is conceptualised using the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007) with contexts networked through direct and indirect social interactions. The microsystems in this case are the educational setting and the home environment of the emergent bilingual young child, interconnected using *digital technology* (DT) and the *virtual linguistic landscape* (VLL) associated with the educational setting. Mesosystem interactions of interest are between the child's educators and caregiver. The educational setting in this case study is a reception Year 0/1 classroom studio (PM1) in a mainstream primary school of an emergent bilingual Chinese 5 year-old child (Lucia) who attended in 2017. This case study draws on ethnographic observations of the LL (physical and virtual) of the educational setting, interviews with educators and caregivers, review of associated documents, and the researcher's journal. The aim of this case is to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that support the presence and use of minority languages within the LLs of emergent bilingual young children, and the development of the LL of the educational setting after approximately one year.

Introduction

I arrived at the primary school around 10 minutes before my scheduled interview with teachers in the Year 0/1 classroom studio. From the carpark, I could already see a large sign at the entrance to the school with the name of the school in Māori and decorated with cultural design. At first glance, the grounds of the school resembled a work in progress, with indications parts of the school remained a building site with orange cones restricting access to certain areas. This was a visible reminder that the school had faced extraordinary circumstances, as it was newly established with recently built facilities to create a merged school. The school was now an open plan modern learning environment in an area

with a high percentage of ethnically diverse children. The closure and merging of schools was experienced across the city and the modern learning environment was similar to the schools within the broader study (Harris et al., 2017). While I had ten minutes to spare, I google searched the school's name on my iPhone to explore their VLL, capture some screenshots and gather some more information about the school and the primary classroom studio. Figure 6a.1 is a screenshot of the multilingual greetings (Māori, Samoan, Tongan, Fijian, Niuean, Cook Island Māori, Indian, Mandarin and English) that appeared on the homepage of PM1's school website in 2017 and 2018.

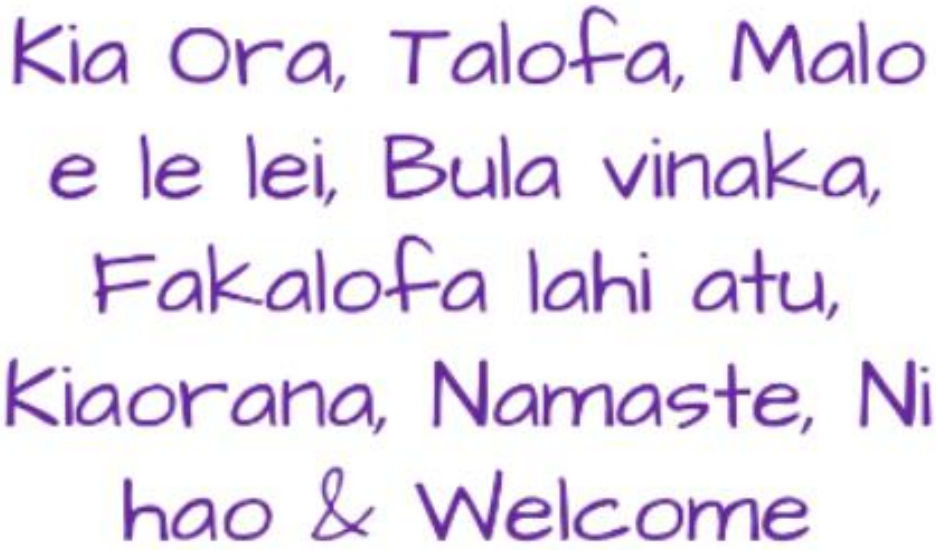

Figure 6a.1: Screenshot of the multilingual greetings (Māori, Samoan, Tongan, Fijian, Niuean, Cook Island Māori, Indian, Mandarin and English) that appeared on the homepage of PM1's school website in 2017 and 2018.

In the VLL of the school website, the home page appeared with a multilingual greeting (Figure 6a.1), reflecting the welcoming of diverse cultures and languages within the school environment. The presence and use of minority languages continued throughout the webpages associated to the school website with external links to content with presence and use of minority languages. The school was a full primary (Years 0/1 to 8) and provided a bilingual learning option with six Māori bilingual classrooms and English as the language of instruction across the other classroom studios. Additional support was available for Samoan children in the school, including integrated enrichment programmes throughout the school with six Samoan staff. The 2018 ERO report stated around half of the children within the school identified as Māori, with nearly one quarter identified as other ethnicities, 15% of

which were Pasifika children. In the community surrounding the school location, around 22% of people spoke more than one language, greater than the 15.8% across the city (Statistics New Zealand, 2013). The most commonly spoken additional languages in this area were Māori and Samoan.

My 10 minutes had passed, so I entered the school grounds in search of signs to direct me to the school office to sign in, and then I navigated myself to the classroom studio where I had planned to meet with the teachers. The name of the primary classroom studio was in Māori, as were the other classroom studios, described as teams, within the school. It was just after 3pm and children were leaving the classrooms and connecting with caregivers and older siblings waiting for them outside. As I entered the classroom studio, it felt modern and inviting, which I commented on to the teachers as I walked in. The acoustics felt soft, the room was brightly lit with natural light, and furniture arranged to create zones within the open plan. Figure 6a.2 is a photo capturing half of the modern learning space of PM1 classroom studio in 2017 with the display of numbers at the top of the image including numbers written in Māori language still present in the LL in 2017 and 2018.

Figure 6a.2: Photo capturing half of the modern learning space of PM1 classroom studio in 2017 with the display of numbers at the top of the image including numbers written in Māori language still present in the LL in 2017 and 2018.

It looked busy with displays but it did not feel cluttered or chaotic. It felt ordered and arranged in a way that looked like the LL supported the systems and routines running within the space. It seemed that through the LL I could see exactly what occurred within the classroom, as there was evidence of

children's work grouped in different spaces around the walls and windows. The floor plan was open and a U-shape with an additional internal room that served as a quiet learning space. The U-shaped floorplan created the appearance that it was not one big open space but one that was open, with nooks and corners. The classroom studio opened out onto an outdoor playground area with play equipment visible from the classroom through large windows.

6a.1.1 People

I met with the Team Leader (Maria) just on entering the classroom studio. I had been in email communication with Maria and I had seen her at the community workshops undertaken by A Better Start Project. There were three full time teachers, including Maria, all were of New Zealand European descent and each identified English as their first and only language. Maria arranged interviews with two caregivers, Belle and Tash, for the end of the week. A description of teachers and caregivers, their pseudonyms, ethnicities and languages, is outlined in Table 6a.1. Interviews in the second visit, approximately one year later, were with Maria and Julie. The key people in this case study were **Maria** and **Belle**, as the educator and caregiver of the emergent bilingual young child, **Lucia**. Interview data from the other teachers and caregiver was incorporated in the findings when it related to Maria or Belle and/or interactions with the developing child.

Table 6a.1

Description of participants in Case One – Mainstream Primary Classroom Studio (Pseudonym in bold).

Participants Pseudonym	*Relationship to child*	*Ethnicity*	*Language(s)*	*Family*
Team Leader (**Maria**)	Team Leader in classroom studio	NZ European	English	
Educator P3A (Julie)	Experienced educator	NZ European	English	
Educator P3B (Kelly)	Beginning educator	NZ European	English	
Parent P3A (**Belle**)	Mother	Chinese	Cantonese, English, Mandarin and a Chinese dialect	Chinese husband and two children; eldest (**Lucia**) in classroom studio in 2017
Parent P3B (Tash)	Mother	Samoan	English and limited Samoan	NZ European husband and three children; eldest is Samoan child in classroom studio in 2017

Belle, the caregiver of interest in this case, was born in China and migrated to New Zealand as an adult, with her husband. In 2016, she lived with her husband and two children, one 5-year-old child (Lucia) attending this mainstream primary school and one child in ECE (not in this study).

6a.1.2 Networked contexts in Case Study One

The microsystems of the caregiver and teachers in this case were networked with other people, contexts and systems interconnected using DT, influencing the presence and use of languages across multiple contexts. Figure 6a.3 provides a visual representation of the networked ecological systems in this case based on Neal and Neal's (2013) Networked Model of Ecological systems. Additional adults and associated organisations were connected to the primary school and the classroom studio however, no identified networks worked directly with Belle or Lucia to support the presence and use of their minority languages. Additional adults associated to the school worked with children at varied times and to various degrees, from one-on-one to groups both within and outside of the classroom studio, mainly to support English and Samoan language development. Māori language development occurred in other classroom studios as a bilingual learning option. Contexts and associations included the Ministry of Education, Community of Learning, Speech language therapists, and Resource Teaching Learning and Behaviour (RTLB) specialists linked to the Ministry of Education.

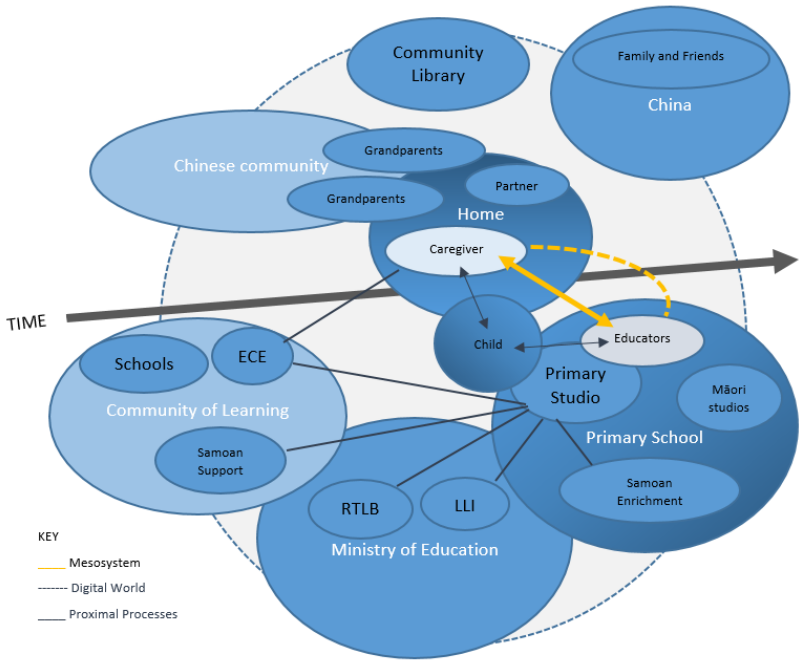

Figure 6a.3: A visual representation of the networked ecological systems in this case based on Neal and Neal's (2013) Networked Model of Ecological systems. Hypothetical direct and indirect social interactions illustrate the proximal processes over time, interconnected using DT.

The school implemented the New Zealand Curriculum (Ministry of Education, 2015), the official statement policy for teaching and learning in English-medium state schools in New Zealand from Year 1 to Year 13 students. The document recognises Māori and New Zealand Sign Language as the official languages of New Zealand. A recent revision of the document has included Learning Languages as a new learning area to "encourage students to participate more actively in New Zealand's more diverse multicultural society and in the more global community" (Ministry of Education, 2015, p. 4). In addition to the learning areas, which included achievement objectives, the values and key competencies are based on the curriculum principles. The principles embody the belief about what is "important and desirable" (p. 9) and includes the principles of *Cultural Diversity* and *Inclusion*. A statement further describing the term *Inclusion,* states that inclusion "ensures that students' identities, languages, abilities and talents are recognised and affirmed" (Ministry of Education, 2015, p. 9). The school charter published on the school website personalised the curriculum to meet the unique diversity of the learning community, as follows,

> Our curriculum is personalized and reflects the bicultural foundations of Aotearoa and the diversity that is present in our unique learning community, challenging and supporting all students to reflect on their learning to achieve personal excellence. (Retrieved from the mainstream primary school website, 2018)

The school was a member of a Community of Learning (COL), a local community group of educational providers, ECE to post-secondary, working together to support learner achievement through shared goals and community engagement. This COL consisted of eight school members and 16 ECE members within the local community. The aim of a COL, led by the Ministry of Education, was,

> By collaborating and sharing expertise, students' learning pathways are supported and their transition through the education system improved. This approach also provides more opportunities for parents, families and whānau and communities to be involved with their children and young people's learning (Education Counts: Ministry of Education, 2019).

One outcome from COL membership was access to a Samoan educator to work with children in Samoan within the school, this also and supported the identification of any additional learning needs

> Within the COL, hopefully, there will be more opportunity. There is a Samoan teacher that's coming in to specifically work with children, I believe, in their first language. But more, [with] children that maybe aren't achieving, working out why. (Maria, 2018)

Additional support led by the Ministry of Education predominantly focused on English language development. The RTLB specialists were funded by the Ministry of Education to work with educators

to support the achievement of students between Y1-10 with learning or behaviour difficulties. RTLBs used a range of programmes, some including assessments of health, education and emotional status of children (Ministry of Education, accessed 2020). Additional activities for English language development were supported by RTLBs, particularly for children assessed as having a low vocabulary, some of whom were children with first languages other than English. For the emergent bilingual child in this case, it was not mentioned in the interviews if she engaged in additional support for English language development. For children in the classroom studio presenting possible language development delays, the teachers had the option of referring children to the RTLB specialist. However, Maria said this took "a bit of time" and the applications for 2017 had closed at the time of the interview in October 2017. This may have implications for bilingual children where language development delays may mask additional developmental or health needs. The programme called Autopilot (White, 2004), a rote learning programme, was one of the programmes set up by RTLB and involved picture prompts of everyday objects to teach and recall vocabulary.

> It's just naming objects in the home and that sort of thing. But it is in English. It's not ... We haven't got lots of different versions with relating it to their first language as well. (Julie, 2018)

An additional programme was the Ministry of Education's Language and Literacy Initiative (LLI) (Ministry of Education, accessed 2020) which was an intervention consisting of educator training with speech language therapists to work with children (5 to 8 years-old) identified as having severe communication difficulties. A major part of this project aimed to engage educators in reflection on their teaching and learning practices. LLI was undertaken by an adult Learning Assistant (LA) and consisted of one-on-one daily conversations with these children, around their interests, for about 15 minutes each day.

> And in English again, we have LLI programme running for children [with language deficits]. So, it's pretty much just having a one-on-one conversation. Making sure you get about 15 minutes and just to get their confidence and language skills and talking to somebody. (Julie, 2018)

Available networks to support emergent bilingual children's English language development were multiple; however, the networks to support emergent bilingual children's minority languages other than Māori and Samoan were limited.

6a.1 The Linguistic Landscape in 2017

Maria, Julie, Kelly and I all sat down together in the middle of the classroom studio on small chairs with my small offering of afternoon tea spread on the table in front of us. We started the interview with Maria describing the class. The mainstream primary classroom studio was designed for Year 0 to Year 1 students. The classroom studio programme was described by teachers as mostly a play-based approach and catered for 5 to 6-year-old children. The majority of children who started in Year 0 in the classroom studio had previously attended an Early Childhood Education (ECE) service in the local area. Maria described the diverse ethnic composition of the classroom studio.

> We've got at the moment 45 children and a significant number of Samoan background children, a significant number of Māori children. I think there's, off the top of my head, maybe 10 or 12 that are Samoan, 10 that maybe identify as Māori and then we've got Tongan, Filipino, Asian [and Indian]. So quite diverse culturally. (Maria, 2017)

Within the classroom studio of 45 children, the ethnic composition was representative of the wider school but with a larger proportion of Samoan than Māori children. This may have been due to some caregivers of Māori children choosing the bilingual learning option for Māori provided by the school, which catered for children Year 1 to 8. This bilingual learning option was situated in a classroom studio separate to the mainstream classroom studio in this case. From where we were seated for our interview in the classroom studio, the majority of the LL was visible in the open plan. When we were talking about the ethnic composition within the classroom studio, Maria directed my attention to the children's profiles displayed on the walls. Figure 6a.4 is a profile display of a child in PM1 that includes their name, photo (face obscured), eye colour, favourite colour, age, height and handprint. Profile displays in 2017 and 2018 were of the different attending children for each year. Maria said the profile display contributed to children's "sense of belonging" (Maria, 2017).

Maria acknowledged that it was in English only and Julie added that they had been "meaning to have a map" (Julie, 2017) as a classroom display to connect with children's ethnic identities. Maria explained how the recently built modern learning environment had limitations in terms of the open space, large windows and reduced number of walls for displays. Julie described how previously the 'single cell' classroom studio environment had multilingual labels throughout the space but the modern learning environment had reduced the ability to use these particular labels.

> And like you used to, where you labelled things in the different languages, and that stuff we used to do, and then haven't done in an environment like this. (Julie, 2017)

Figure 6a.4: A profile display of a child in PM1 that includes their name, photo (face obscured), eye colour, favourite colour, age, height and handprint. Profile displays in 2017 and 2018 were of the different attending children for each year.

When discussing the LL of the old single cell classroom, Maria said that development of the LL in the modern learning environment means the construction of more permanent displays. These permanent displays contributed to the classroom studio culture.

> But then I guess those sorts of things would be a little bit more permanent, but kind of change it up to suit the children. So once you've got those in place it just becomes part of the culture. (Maria, 2017)

Figure 6a.5 gives an overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the classroom studio in PM1 in 2017 (n=65). As shown in Figure 6a.5, English language dominated the languages visible in the mainstream studio with 59 photos containing linguistic items in English only. English and Māori were also present in six photos (including 6a.2 and 6a.6). Although no other languages were observed in the LL observational photos, additional Māori language and cultural designs were present in the school's VLL (Figures 6a.1 and 6a.11).

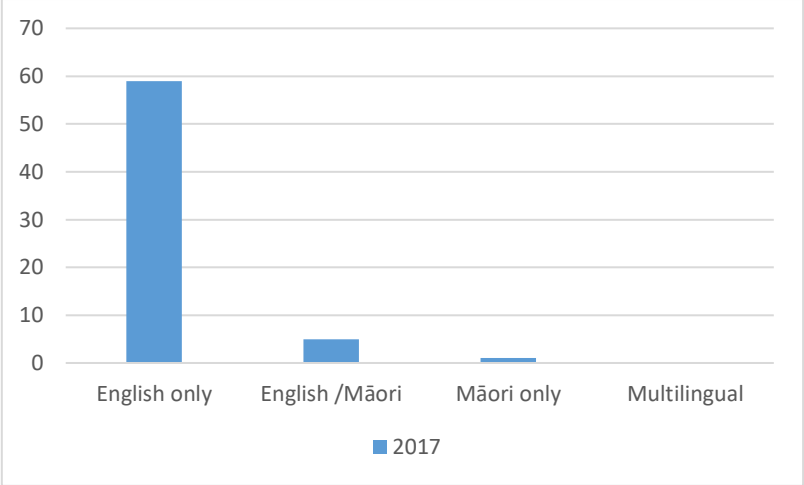

Figure 6a.5: An overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the *classroom studio in PM1 in 2017* (n=65).

Maria acknowledged that English language dominated the studio environment with literacy development solely in English. Figure 6a.6 are examples from the LL that illustrate English literacy content and teaching strategies supported by the LL in the form of removable laminated signs observed in 2017. As I reflected on the LLs I have gathered in this community area, the LL in this case is somewhat representative of the LLs with English as the majority language. My impression was this LL in PM1 seemed to be managed and controlled by the teachers as the displays were neatly mounted and many in high to reach areas. Despite extensive display of children's work and photos, it seemed the LL was the educators' landscape, reflecting their programme, educational values, systems, and was their teaching and learning mechanism within the primary classroom studio.

Figure 6a.6: Examples from the LL that illustrate English literacy content and teaching strategies supported by the LL in the form of removable laminated signs observed in 2017.

6a.2.1 Educational Setting Proximal Processes in 2017

Proximal processes (Bronfenbrenner & Morris, 1998) are direct interactions with people, objects and symbols, that drive development and occur within a larger ecological system where interactions between and across systems are reciprocal and mutually influential. The proximal processes identified from interview data illustrate the interactions within the microsystem of the mainstream primary studio that relate to the presence and use of minority languages. Use of minority languages was mostly limited to Māori and Samoan languages, where Samoan language was heard being used between children and observed in the VLL. Use of Samoan language was supported through the Samoan enrichment programme and Samoan language use between children not discouraged within the classroom studio. DT activities were in English only, which teachers said they thought had varying, perceived educational benefits.

Presence and use of minority languages in the educational setting

Teachers incorporated minority languages into the daily classroom studio practices by singing songs and using "basic commands and that sort of thing" (Maria, 2017). Figure 6a.7 is a bilingual poster with basic greetings in English and Māori displayed in the classroom studio in 2017 and 2018 reflective of the type of Māori language use within the educational space.

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> And like with songs, within our classroom and that sort of thing and just little directions. Stand up, sit down, *e tū* [stand up]. Yeah. *Haere mai* [Welcome] that sort of thing. So, from that point of view a little bit [of minority language use]. (Maria, 2017)

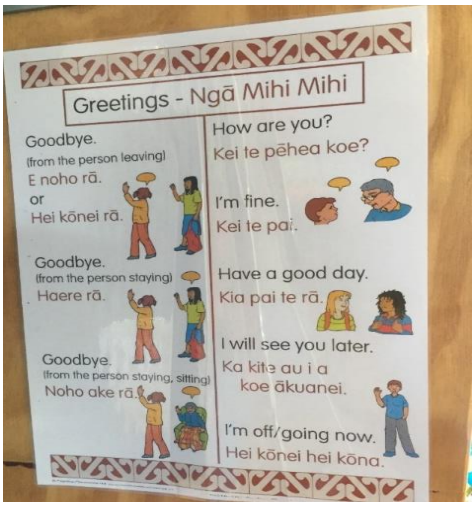


Figure 6a.7: A bilingual poster with basic greetings in English and Māori displayed in the classroom studio in 2017 and 2018.

Maria said she considered the use of Māori language within the classroom studio stronger than the use of Samoan. *Kapa Haka* [Māori cultural performance group] was available to all children once a week in 2017. Samoan children could have a higher level of Samoan language use by participating in a withdrawal programme with Samoan-speaking educators. This Samoan enrichment programme was undertaken within the school, in which children were withdrawn from class once a week for language enrichment.

> The Māori part of it is probably a bit stronger in the classroom setting than it is for the Samoan speakers. They would get more of it by going out to the cultural class. (Maria, 2017)

Oral language development practices in English centred on stimulating children's speaking by creating experiences and utilising real world activities for them to connect and share with teachers and other children. Figure 6a.8 shows examples from the LL that illustrate English literacy teaching (word endings, sight words and the alphabet) content and strategies supported by the LL with removable laminated signs in relation to the educator's small group desk in 2017. Children's artwork displayed above.

Figure 6a.8: Examples from the LL that illustrate English literacy teaching (word endings, sight words and the alphabet) content and strategies supported by the LL with removable laminated signs in relation to the educator's small group desk in 2017. Children's artwork displayed above.

Other examples mentioned in the interview included playing with puppets to mediate retelling stories, using word banks for writing, outdoor excursions giving children the opportunity to talk with each other.

> In trying to you know, when the children are in here we're always talking to them. "What did you do last night? What did you do on your holidays?" You know, you just, you're talking to them, trying. Yeah, that would be our number one thing, getting them talking to each other, and to us. (Maria, 2017)

The teachers thought that it was probable that children would communicate with one another in their minority languages in the classroom studio environment, which the teachers did not discourage despite the teachers not comprehending; however, there was no intentional facilitation of peer conversations in shared minority languages to support the use of minority languages within the educational setting. Maria said that she thought that the perception from the home environment was that the educational setting was for English only.

> I think probably there'd be some children in here, like Samoan, they might speak to each other in their first language, but I think the perception from home is when you are at school you speak English. (Maria, 2017)

Opportunities for capturing children's voices was observed in the LL of the classroom studio (Figure 6a.13, 6a.14, 6a.15 and 6a.17), with all visual representation of children's voices in English only. It was more common for senior students in the school to speak in Samoan to one another within the school environment. However, due to limited comprehension by teachers, Maria said it had the possibility to cause tensions if the students were speaking inappropriately in a language not understood by the teachers.

> In the senior school, a lot of them speak to each other in their own language. I don't know if that's so that the teachers can't know what they're saying. That becomes a problem. (Maria, 2017)

One difficulty mentioned was that educators were unable to comprehend minority language use within the classroom studio and therefore may not be able to support the resolution of social issues within the class. Julie, however, did say that it was possible to begin to comprehend inappropriate language used in languages other than English.

> And then sometimes they'll go, "Oh, so-and-so said this," and I'll just go, "What were you saying? I know what you were saying," and I'd have no idea what they were saying. (Maria, 2017)

> What you do is you pick up the swear words real quick, and you can hear those. (Julie, 2017)

Maria said she consciously tried to use languages other than English within the classroom studio environment, as it was for the benefit of the children with minority languages, which she said was to "try to for them" (Maria, 2017). Maria said her perception of minority language presence and use within the classroom studio was that there could be more incorporation, and added, "I don't think we're doing a very good job" (Maria, 2017). However, given that all teachers within the classroom studio environment were monolingual English speakers, the presence and use of languages other than English was challenging, particularly when literacy instruction was in English and there was an external expectation for children to be meeting National Standards in English literacy.

> I do think that [incorporation of minority languages] is the challenge though, isn't it? And it's keeping that forefront in your mind, too. Because when you think back over the years, different things that you've done, and then it kind of slips off; and then national standards comes in and it's like, "Right we've got to get these kids to standard." You sort of tail off and forget about all these things that are, probably, well not probably, that are really important. (Maria, 2017)

Additional macrosystem influences interacting within the educational setting microsystem contexts mentioned in the interviews were the National Curriculum document and National Standards emphasis on teaching reading and writing in English. National Standards, introduced in 2010 and then removed by the New Zealand Government in 2018, assessed progress and achievement in three key learning areas; reading, writing and mathematics. A large percentage of children in the studio were at or above the National Standards. Maria said "80% of our class are at or above standard, so, that's quite good" (Maria, 2017).

Interacting with digital technology and the virtual linguistic landscape

In October 2017 the classroom studio Y0/1 team had an internet connected screen, eight iPads and three educator laptops. Figure 6a.9 shows the mat area with tiered seating facing the internet-connected screen on the right, present in PM1 in 2017 and 2018.

Figure 6a.9: The mat area with tiered seating facing the internet-connected screen on the right, present in PM1 in 2017 and 2018.

Maria said there were minimal applications on the iPads for the children to access. A description on the school website indicated the type of activities intended for students in Years 1 – 4 was mostly literacy and mathematic applications.

> Students in Years 1 - 4 use iPads to enhance their learning programmes.
> Each Team has a pod of iPads, which students can use to access such things as Reading Eggs, Mathletics, and demonstrate their learning through apps such as 'Explain Everything' (School website, 2019)

The majority of iPad use in the classroom studio in 2017 was during literacy time with apps and audiobooks to support English language development. Figure 6a.10 shows the 8 iPads and headsets available for use within the classroom studio in 2017. The content on the iPads was managed and selected by a school technician, which created a process the teachers said removed the opportunity for them to test and trial alternative apps and content. Teachers indicated they perceived the DT as having more potential within the classroom studio but did not elaborate on what type of apps and content would be beyond “basic literacy” apps and content.

> The children use it a bit during reading time, but they're just doing basic literacy stuff on it. That's all at this point in time, and in English. (Maria, 2017)

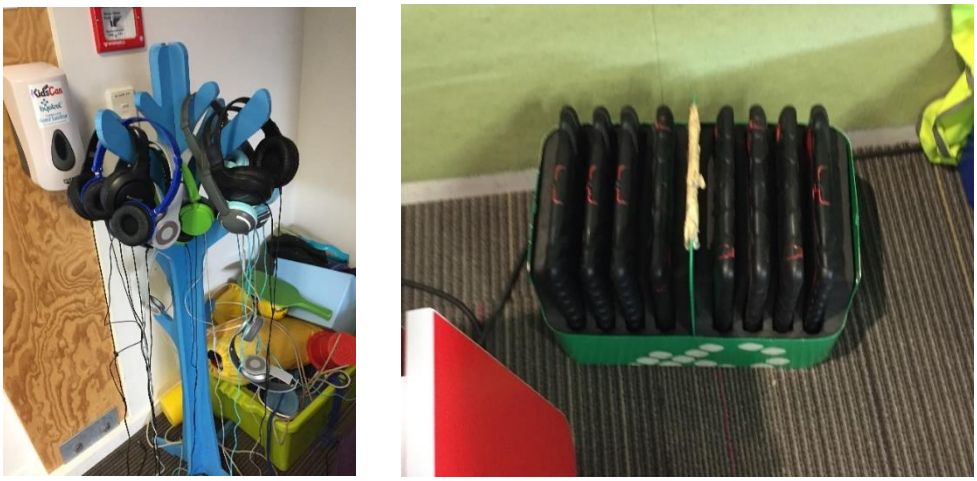


Figure 6a.10: The 8 iPads and headsets available for use within the classroom studio in 2017.

In a passing comment earlier in the interview when I questioned teachers about minority language content on their iPads, I added that there might not be much content currently available. Maria added, "There would be" (Maria 2017). Maria said there was value in using the iPads within the studio if the activity was intentionally supporting children with their learning. However, children's experiences with DT within the home environment influenced how children perceived and used DT in the classroom studio, which Maria said was difficult for teachers to alter as it contrasted with educator's perceptions of "proper" use.

> If it's the right thing and it's supporting them and helping them, then that's good. But they come to school seeing tablets as a play type thing, so it is a little bit [of a habit, it is] hard to break that. (Maria, 2017)

Julie said time was necessary to work with children to change their perception on how iPads were to be used "properly", which Julie adds in reference to Maria's comment to above, that the iPad was perceived as a plaything and not a learning tool. Teachers needed to monitor children's activities on the DT, which took away from the instructional reading that was regarded as higher quality learning in comparison to the lower quality apps on the iPads. Therefore, the use of the DT in the studio was less prioritised in the classroom studio-learning programme.

> And because there's not that many great apps on it at the moment, that hasn't really been a focus of ours. (Maria, 2017)

We had been there chatting for just over half an hour, I did not want to hold them up so we concluded the interview and the teachers were happy with me spending another ten minutes taking videos and photos of the walls.

6a.2.2 Home Environment Proximal Processes in 2017

I met Belle and Tash in the staffroom four days after my interview with the teachers. Maria invited us to help ourselves to tea and coffee while we conducted our interview. Both Bell and Tash had children attending the Y0 to Y1 classroom studio with Maria in 2017. Belle is the person of interest in relation to the developing emergent bilingual young child.

Although her daughter Lucia spoke and understood Cantonese, Belle perceived Lucia's competency in English as higher than Cantonese. Belle attributed most of Lucia's English language development to attendance in mainstream ECE prior to entering primary school. Lucia could also comprehend Mandarin and her maternal grandmother's dialect but she was reluctant to use her minority languages and she preferred to use English. Overall, the home environment involved proximal processes with up to five languages with extended family living close by. Lucia had opportunities to interact in English, Mandarin and in her grandparents' dialects within the home environment with relatives directly and via DT. The home environment had various DT devices that Lucia interacted with, some including additional languages.

The level of caregiver empowerment to use home languages in external environments and communities varied depending on the nature of the context. In more mainstream English dominant population environments, such as her child's sports activities, Belle still asserted that she could communicate with her children in Cantonese in the same way as she could at home. However, she added that in English dominant settings, the volume of their communication was reduced making it less audible to others so Cantonese became the language for private interaction between herself and her children. She did not elaborate as to why this was.

> Cantonese, yes. Cantonese. But not loudly. Cantonese, almost, yes. Just like, just like at home. Yes. (Belle, 2017)

In the home environment, Belle's strong motivational force for her children to learn Cantonese and the additional languages within the home was to enable them to communicate and connect with immediate and extended family, many of whom did not speak English. The child's maternal and paternal grandparents had also migrated to New Zealand and lived in close proximity to Belle's home. Belle said Lucia maintained regular contact "talking lots" (Belle, 2017) with her maternal grandparents. Lucia also interacted with her other grandparents living in New Zealand and extended family living in China. The languages of the grandparents were not identified, nor how often or how regular interaction with grandparents was.

The Chinese retail area, with a high concentration of Chinese restaurants and businesses, was one context that enabled Belle to interact with community members in multiple languages, including her own dialect in a setting that normalised her language use. Belle said that in this language environment she felt like she was able to communicate to her children in the way that she would use languages in the home. Although her children were attending English dominated education settings in New Zealand, Belle had a strong commitment to continue the development of Cantonese.

> Because you can talk to family, yes. Otherwise, in the future you learn more English is good for you. But the most important things is you can talk to family. Yes, I will continue talk in Cantonese to her and my son. Yes, I will keep doing that. Yes. (Belle, 2017)

Proximal Processes within the home environment

The proximal processes within the home environment microsystem involved interactions in a variety of languages with a variety of family members both locally and internationally. The shifting power, direction, content and form of those interactions vary in the following descriptions.

Presence and use of languages in the home environment

Given the limitations on gathering LL data from within the home, as the interview was undertaken in the school environment, Belle was not directly asked if there were languages visible on the walls within the home environment. However, through the conversational interview Belle referred to resources in the home that included minority languages that could be considered the LL of the home environment. In total, the home environment had up to five different languages used. Whilst Cantonese was used most regularly within the home, translanguaging with Mandarin and English occurred occasionally when required.

> Not just Cantonese but sometimes you need to talk Cantonese and English combined, yes. (Belle, 2017)

Belle and her husband spoke Standard Cantonese to each another in the family home environment. In addition, both adults spoke Mandarin and their own dialects with their own parents. The two dialects were distinct and shared some linguistic similarities.

> We speak Cantonese at home but my husband speak different dialect with his mom and I speak different dialect my family. (Belle, 2017)

The family had close connections with extended family in Aotearoa New Zealand. There were regular and ongoing opportunities for Lucia to engage and acquire additional languages from within the family context. Belle identified the general strategies she used to support Lucia's bilingual language development such as facilitating her translanguaging, reading books and singing songs. It appeared that Belle's approach to language acquisition was predominantly in and through the interaction and connection within family relationships, as Lucia received no formal language instruction in additional languages. Despite Lucia being less willing to engage with languages other than Cantonese and English, occasionally Lucia would actively request translations in Mandarin; this could indicate that Lucia had some level of motivation and interest in acquiring Mandarin.

> No. I don't know, she doesn't want to talk another [language]. She can understand Mandarin but she doesn't want to talk. Cantonese, she will speak Cantonese. But sometime she will speak a little bit Mandarin. Sometimes she will ask, "Mom, is it (says something) in Mandarin?" She will ask. (Belle, 2017)

Belle said she wanted Lucia to acquire Cantonese; the majority of interactions within the home environment were in Cantonese. However, there were competing motivations within the home as her husband, although speaking Cantonese to his wife, would speak to both children in English as a means to assist him in improving his own English language. This was different to Belle's choice to speak mostly Cantonese with their children, as said she believed that her children would acquire English in the immersive setting of New Zealand society easily without the need for English language development within the home. Belle expressed concerns about the family's ability to maintain Cantonese in New Zealand as Cantonese was the language of communication with extended family. It was important to ensure her children were capable of offering a continuation of family support through connecting with extended family in Cantonese.

> I want him to talk Cantonese to her. English you can, this is a big environment for English but if you don't speak Cantonese anymore, you lost that. You can't talk to them. Because my family, the most family member, they don't use in English. So we need to talk to them. We need to help them to do the things. If you only talk English, then you talk Cantonese, you can't talk anything. You can't help. That's very important. This is a big environment in English so you can learn English very easy, unlike others. And the kids, they learn language very fast. (Belle, 2017)

Belle's children interacted in some languages more frequently than others. As Belle's parents immigrated to New Zealand earlier than her husband's parents did, it appeared that her children could comprehend her dialect but not her husband's. Belle said this was because Lucia had interacted more with her dialect due to her parents immigrating to New Zealand years before her husband's parents

did. Motivation to interact in Belle's dialect seemed to be bidirectional as both Lucia and the grandparents initiated "talking to" (Belle, 2017).

> They can understand Cantonese and Mandarin and my dialect. Yes. Because my parents talk lots to her. I think she's try to start her granny to talk to her. Because her granny's just come here for just three years but my parents here for longer so they start to talk to her longer. But sometimes she will talk to her she will try. (Belle, 2017)

The children were not encouraged to write in Cantonese due to Belle's perceived level of difficulty involved in learning the characters and the degree of difference between the English and Cantonese writing systems. Lucia could recognise and understand the meaning of her own name in Chinese characters. Lucia had a writing book in Chinese but did not want to write and preferred drawing. Belle was satisfied that Lucia could read and write her own name in Chinese characters.

> Her name. Yes, I want her can understand. Can read that but not write, that's too hard to her now. (Belle, 2017)

Belle's children had access to storybooks in Chinese purchased by Belle in China. These books were interactive with audio and supported the foundation for associating Chinese characters with spoken words.

> I bought some Chinese books from China. So I got Chinese book in my home, in my home [town]. The storybooks. And we got a pen, a pen you can just tap here, and then you say the word. Sing a song, and read the book. (Belle, 2017)

Belle accessed the local community library for resources; however, it is not clear if those were in English and/or included minority languages.

> Sometimes we will rent some book from library, yes. (Belle, 2017)

The community library was accessible through DT with e-books available to borrow online. This digital collection of books on the community library website also included links to the foreign language-learning app Mango and a small collection of children's e-books in Mandarin.

Interacting with digital technologies and the virtual linguistic landscape

The home environment had a variety of DT devices with internet connection such as an iPad, digital television and smart phones. The digital television enabled access to content from around the world; the majority of content viewed appeared to be from China, USA and England. Belle used WeChat, the Chinese multipurpose messaging, social media and mobile payment app, to communicate and video chat with her social connections in China. She also used Weibo, the micro-blogging platform. The children enjoyed watching television on the large screen in the living area of the home. Television viewing was often not sedentary, as Lucia would engage in physical activity.

> TV, yes. Watching TV and she's doing cartwheels all the time at home. (Belle, 2017)

There was variation in the degree of shared experience mediated by DT in the home depending on the nature, size and location of the DT device. The television enabled Belle to have a better awareness of the content her children were viewing. Handheld DT was less of a shared experience. The majority of television content was in English but Belle actively encouraged viewing content in Mandarin. This may have been due to the shared nature of the television.

> More in English. I encourage her to watch the Mandarin's cartoon. Sometimes, yes. (Belle, 2017)

When asked about the amount of time her children spent using DT, Belle reported the amount as a "long time" (Belle, 2017). She said she had concerns about the possible implications excessive DT use could have on her children's eyesight. She was not asked if there was any particular type of DT use that was of more concern.

> I so worry about that. Their eyes. (Belle, 2017)

It seemed that DT management in the home was prompted by external cues such as the daily schedule or external motivators. When asked if she could manage her children's DT use, she responded "I can stop her when I doing cooking" (Belle, 2017). This statement could imply that there may have been situations where Belle experienced challenges getting her children to stop using DT. This inference was reinforced by Belle's description of Lucia's negative emotional response when Belle turned the DT off.

> Mad. Mad, yeah, yeah. (Belle, 2017)

Belle appeared to have concluded that an effective management strategy was to take the children out of the home. The home environment was situated within close proximity to green space and the school. The power Lucia may have had over when and how long DT was used was demonstrated by the child's choice of devices, in particular Lucia's preference for her mother's smart phone. All of the mobile DT in the home environment had the same internet access and Apps available. Lucia's main activity on the DT was viewing YouTube, watching videos associated to her interests, which could be accessed through all the other devices in the home. Belle was uncertain as to why Lucia wanted her phone in particular.

> My daughter doesn't use iPad or other phones. Only my phone. "My phone's special. Yes?" I don't know. "I can give you iPad or other phones or other tablet, but why you just want my phone?" I want my phone too. (Belle, 2017)

Belle's own mobile phone use was often when she had the opportunity for free time. Belle said that all of her free time would be spent on her mobile phone. When Belle said this in the interview with the other caregiver Tash, Tash added to this by saying, "you find the time" (Tash, 2017) to which Belle agreed. This agreement indicated that both parents actively sought time for mobile phone use and suggested that parental smartphone use was motivated predominantly by opportunity.

> Belle: If I got time, I will use all the time on my phone.
> Tash: You find that time.
> Belle: Yes.

As mentioned, the children's main use of the DT was to view YouTube videos. Although it may be assumed that this activity could be classified as passive entertainment, there were indications that the YouTube videos had potential to prompt Lucia's imaginative play.

> Yes, she's watching YouTube. Yes, YouTube and some apps for drawing, yeah, something like that. My daughter is watching some make up and pregnancy, not a person, the dolls. Yes. Just pretend. (Belle, 2017)

Within the home environment a range of proximal processes were associated to the presence and use of minority languages within the home environment, many of which were mediated by DT. There were a number of challenges facing the presence and use of minority languages in the home. As the child's fluency in English overtook fluency in Cantonese, interacting mesosystems that supported the presence and use of home languages would be important for supporting minority language development across all settings. After this interview, with permission from Belle, I told Maria about Lucia having up to five languages within the home and her mother's desire for Lucia to recognise her

Chinese name in Chinese characters. Maria's immediate response to this information was the idea to incorporate Lucia's Chinese name in Chinese characters into the classroom studio name labels used for wall displays and books to make her Chinese identity more visible. However, this was not observed in the second visit due to Lucia moving to the Year 2 classroom studio.

6a.3 Mesosystems – Caregiver and Educator Proximal Processes in 2017

Both the educational setting and, to a lesser extent, the home environment of the emergent bilingual child in this case have been described in detail to appreciate some of the proximal processes that support the presence and use of minority languages in each setting, some of which were mediated by DT and the VLL. The proximal processes were defined as interactions with people, objects and symbols, this included DT as an object within the environment and the languages as the symbols visible in the LLs of the educational setting, both physical and virtual.

Proximal Processes within the Mesosystem

The proximal processes identified from interviews and observational data illustrate the interactions between the caregiver and teachers of the emergent bilingual Chinese young child between their associated microsystems. Despite the school processes for gathering information on the child's minority language use in the home environment, there was no presence or use of Lucia's languages within the LL in 2017.

Presence and use of minority languages and the virtual linguistic landscape

Belle said Lucia had attended a mainstream ECE, in which she acquired most of her English language, and then transitioned to primary school. The educators across both the ECE and primary setting created a warm relationship with her children so Belle said there was a sense of belonging and ease in connecting with other caregivers. She described the relationship the educators had developed with her youngest child, who attended the same ECE centre Lucia attended.

> Yeah, because the teachers are very nice. We just like friends and they love my [youngest child]. (Belle, 2017)

The primary school teachers maintained relationships with contributing ECE centre educators, including the Samoan immersion ECE centre (not in this study). This contact involved the ECE teachers visiting the Y0/1 primary classroom studio. Maria said her aim in the future was to take the children from the classroom studio to the Samoan ECE to visit.

> At the moment, they come and visit. They sometimes bring the children over before they come. We'd love to take children back there and that's our aim. It's just making it happen time-wise and that sort of thing as well. (Maria, 2017)

The record of children's learning experiences in the ECE was officially recorded in the child portfolio book (physical and/or virtual). As the portfolios were considered property of the child, the physical profiles were sent home with the children at their conclusion of ECE. Information contained in children's ECC portfolios or e-portfolios, were not officially shared with the teachers in the primary classroom studio, however Maria said they did encourage caregivers to bring their portfolio, physical or virtual, to school. This provided an opportunity to discuss the portfolio with the family.

> Yeah, we encourage the children to bring their portfolios into school, but it doesn't happen a lot here. And that's something that we've talked about too, with the early childhood centres. Essentially, how can we make that happen? Because they get sent home with the children from early childhood and that's where they stay. So that is really good if they bring them in and we can talk about them. (Maria, 2017)

Belle said no action was taken, by either of the educational settings, ECE or primary, to encourage and incorporate Lucia's languages and culture into her learning. This lack of integration of minority languages within the educational setting may have supported Belle's expressed opinion that the development and maintenance of minority languages was dependent on her own personal motivation for intergenerational transmission and separate to the educational setting. Maria explained that caregivers recorded information about the home language environment and ethnic identity on the school enrolment form. This information was corroborated and elaborated on when teachers talked to caregivers in informal conversations to check what languages their children were speaking.

> [Home language use and ethnic identity is] noted when they enrol at school, so we can just click onto eTAP [school management software] and bring that up and it prints out a sheet for us. So we do know that and we put that into our class description and then also by talking to the parents. So especially our second language children we always check what language they're speaking at home, what their first language is. (Maria, 2017)

Knowing the extent to which children were speaking languages in addition to English involved teachers having direct conversations over time with caregivers, where teachers could informally learn about the child's home language environment, however it was not mentioned if families were asked about their minority language networks. Minority language competencies and assessments in minority languages were not evaluated or recorded in any formal way. Therefore, educators did not have information on a child's language development that may have revealed any language development strengths or weaknesses for the educators to build on. Literacy measurements and instruction were limited to English, with monolingual language developmental norms as typical. Understanding additional language development issues had the potential to remain invisible, which Maria identified as a particular barrier for her as a monolingual educator.

> But for us, I guess, the barrier is that I personally don't know those languages, so it does make it very heavily dominant in English in the classroom. When we're trying to teach them to read and write in English, that is our main focus. But I'm very aware that if they have weaknesses in their first languages, or a strength in their first language, we might not be seeing it. We've got to look at those children that are having issues and kind of work out why. (Maria, 2017)

Maria described examples of Samoan bilingual language development in the mainstream primary studio, which was supported by additional adults and associations (Figure 6a.3). One concern Maria had heard caregivers express was that Samoan language competencies in the home environment varied amongst Samoan families and not all children had Samoan language used regularly within the home.

> A lot of the parents are sort of saying, especially as Samoan parents, we don't speak it very much at home. You know, it doesn't seem to be very strong at home either. And we've got a few children, one in particular is quite weak picking up the English. (Maria, 2017)

In the example of the Samoan child, the child's first language was not stronger than English, and the child's English acquisition was viewed as being "weak" (Maria, 2017. Therefore, Maria identified a need to assess the child's first language skills to identify concerns and make comparisons with the child's English language skills; however, no standardised Samoan language testing was available for measuring bilingual developmental norms for comparative analysis.

> I'm thinking "how can we get [the child] assessed in their first language, get [the child] assessed in Samoan?", and see what's happening for [the child] there. And then try and make some comparisons. It would be tapping into some of the other people, and they could have a conversation with them in their first language or kind of gauge where things are for them. (Maria, 2017)

In this case, Belle, who was fluent in Lucia's main minority languages, could be considered a key person for evaluating her child's weaknesses and strengths in Lucia's minority languages. Sharing children's learning experiences with caregivers therefore is a proximal process to strengthen the educator and caregiver partnership. Maria did note that some caregivers might not be comfortable with coming into the studio, which perhaps raises the issue of establishing connections with families in ways that extend beyond those inside the context of the physical classroom studio.

Connecting through digital technologies and the virtual linguistic landscape

The teachers listed ways in which they connected with caregivers, family and the community through the VLL:

- blogging through the school website, including a blog from the classroom studio Year 0/1 team
- sending photos of school events and classroom studio activities (online or on paper)
- texting via mobile phone
- emailing
- Additional school wide communication also occurred via the PM1 App and Tweets via Twitter

The studio blog was the main form of electronic communication with the home environment in 2017 and was accessible through the school website. The blog was in early stages of development and the teachers were learning how to use the blog more effectively and at times included Māori and Samoan. Figure 6a.11 illustrates an example of a blog post from 2017 with the incorporation of Māori language with *kōrero* [conversation] used to communicate directly with caregivers and updating them on children's developmental play activities. "We're still developing [the studio Blog] really, aren't we? Getting our heads around making that happen a bit better." (Maria, 2017)

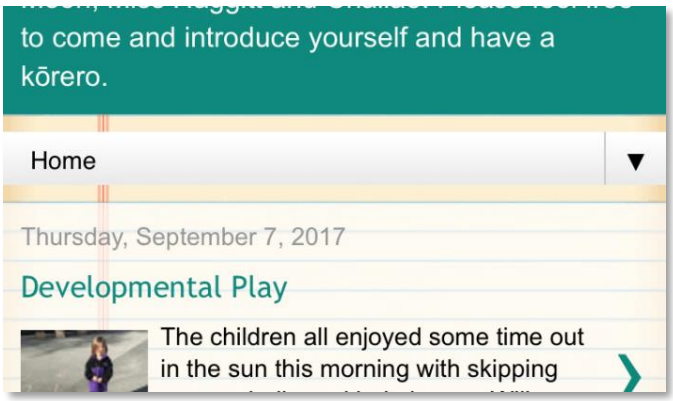


Figure 6a.11: A blog post from 2017 with the incorporation of Māori language with *kōrero* [conversation] used to communicate directly with caregivers and updating them on children's developmental play activities.

In 2017, the classroom studio was not using an e-portfolio system but the teachers were considering SeeSaw, an e-portfolio for sharing children's learning with caregivers in which caregivers can respond with comments. I was looking forward to returning in a year to capture the development of the LL in a years' time. Over the months following the interviews, I collated a LL report and emailed it to Maria at the end of 2017 for her team to review. No revisions were made to the LL report.

6a.4 Time – The Linguistic Landscape of the Educational Setting after One Year

Approximately 10 months later, I returned to the primary classroom studio to capture the LL and interview teachers. As I entered the classroom studio, the LL felt familiar with displays from the previous year indicating a continuation of the classroom programme from 2017. I immediately noticed a large display with maps, flags and multilingual greetings that they had mentioned in their interview in 2017 that they had intentions to develop. This time Kelly was not present for the interview, so my interview was with Maria and Julie only. I began the interview by asking about the LL report that I emailed to them at the end of 2017. Maria said that the LL report prompted reflection of the LL of the classroom studio environment. Maria had described the LL as "basic" (Maria, 2018) and a foundation for ongoing development to increase the presence and use of minority languages responsive to the needs of the children.

> I mean, I did read [the LL report] There's always, obviously, more that we can do and timeframe we can keep developing it because I think we were very, basic. Last year after that first report. So, yeah. Obviously, there would be lots more that we can do and hopefully we can just keep building on [the LL of the classroom studio] and developing different ideas and depending on the needs of the children. (Maria, 2018)

The return visit in 2018, observation of the LL in the primary classroom studio showed the number of displays with English had reduced and there was an increase in bilingual displays with English and Māori. Figure 6a.12 gives an overview of photographic evidence, as categorised by language visible*,* in the linguistic landscape of the classroom studio in PM1 in 2017 (n=65) *and 2018* (n=50). In addition, there was a new multilingual display. A world map with multilingual greetings and flags (Figure 6a.19) was displayed at the entrance of the classroom studio (Figure 6a.22) to welcome and normalise the use of minority languages within the space. The development of a multilingual display and the use of the e-portfolio system (Figure 6a.23) mediated bidirectional interactions between teachers and caregivers, which supported the presence and use of minority languages within the primary classroom

studio. The world map display and e-portfolio were selected as artefacts, described in more detail below.

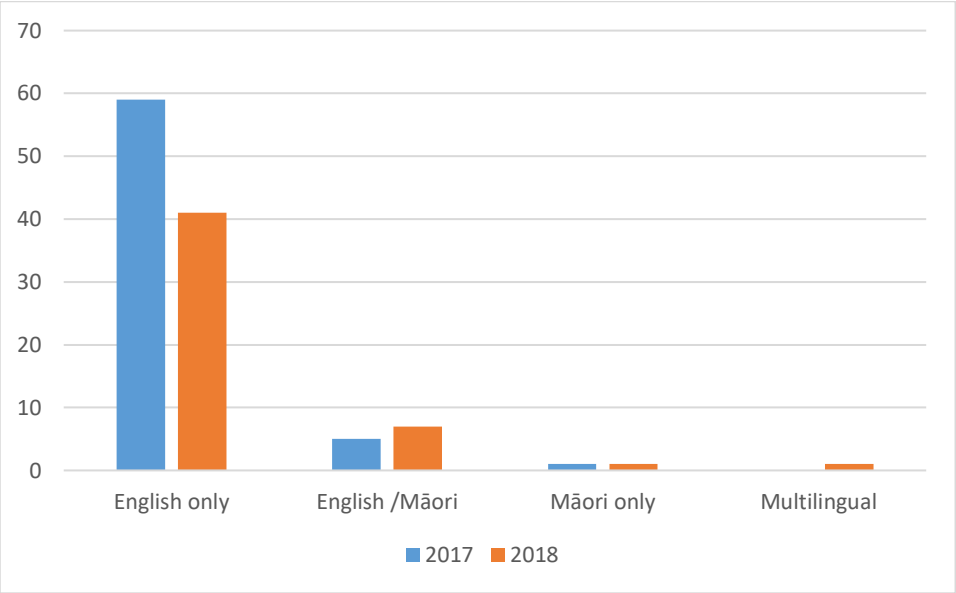


Figure 6a.12: An overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the classroom studio in PM1 in 2017 (n=65) *and 2018* (n=50).

In 2018, more opportunities for the presence and use of Māori language occurred in the classroom studio. Kapa Haka, an activity undertaken outside of the primary classroom studio, was now incorporated into the classroom studio programme on a regular and ongoing basis.

> We've got a Kapa Haka now, which we didn't have a year ago. So, we have that once a week for half an hour for this block and half an hour for the other juniors. It's just lots of singing and actions but he talks about it as well. About what does this mean and getting them to pronounce it the right way. (Maria, 2018)

In 2018, Maria added more description of the Samoan language enrichment programme that continued for Samoan children. Maria described the intention of the programme was to support children's English language development through the use of Samoan language. However, it was unclear what the particular ratio of Samoan to English was or if a Samoan language development programme was in place.

> I think probably, from what I understand, she's using their Samoan language to support their English. Yeah. I think it would be more from that role. That, yeah. Yeah so, from what we've seen of it, it's not totally just supporting their English. They still get Samoan language part of it. (Maria, 2018)

Figure 6a.13: Capturing children's stories displayed in PM1 with their illustrations (2018).

Much of the LL in 2018 seemed a continuation from the previous year but with content created by new children attending. I noticed that in 2018, I could observe the representation of children's stories, learning experiences and voices more clearly, in what seemed to be richer displays representing multiple elements of the children's learning processes. Figure 6a.13 is an example of capturing children's stories displayed in PM1 with their illustrations (2018). Figure 6a.14 illustrates a display fixed to the windows of children's drawings of astronauts with digital profile photos of children's faces and handwritten speech bubbles capturing children's voices (2018).

Figure 6a.14: Display fixed to the windows of children's drawings of astronauts with digital profile photos of children's faces (faces obscured) and handwritten speech bubbles capturing children's voices (2018).

An additional display (Figure 6a.15) included photos of the children's learning experience, their descriptions of their creations and their creations displayed together to display the stages of the child's learning process. Figure 6a.15 illustrates the display capturing children's voices and creations with display including photos of children while holding their creations, word-processed and printed description and children's art displayed together in PM1 in 2018.

Figure 6a.15: Capturing children's voices and creations with display including photos of children (faces obscured) while holding their creations, word-processed and printed description and children's art displayed together in PM1 in 2018.

In 2018, the classroom studio had the same DT devices that they had in 2017. In 2018, there were additional apps on the iPads accessible to children with Māori language content, which suggested the available content on the iPads developed to include Māori language apps in 2018. Teachers continued to use YouTube in their teaching to access content; however, it was not mentioned in the interview if this content included more complex minority languages beyond multilingual greetings. It was interesting to note that in 2018 the teachers spoke more about their knowledge of their children's home use of digital technology. The educator's understanding of children's virtual environments was based on the children's conversations within the studio. Maria said there had been "quite a lot of PlayStation talk" (Maria, 2018) and they heard children talking about the online battle game Fortnite. One child, with older siblings, appeared to have been playing a 16-year-old rated game. The children's conversations of DT experiences in the home environment were observed within the classroom studio as teachers heard children discuss their experiences with other children. Figure 6a.16 is an example

of a shared writing task observed in the mat area that is inclusive of a child's weekend experiences, which include use of a "tablet" and going to the library (2018).

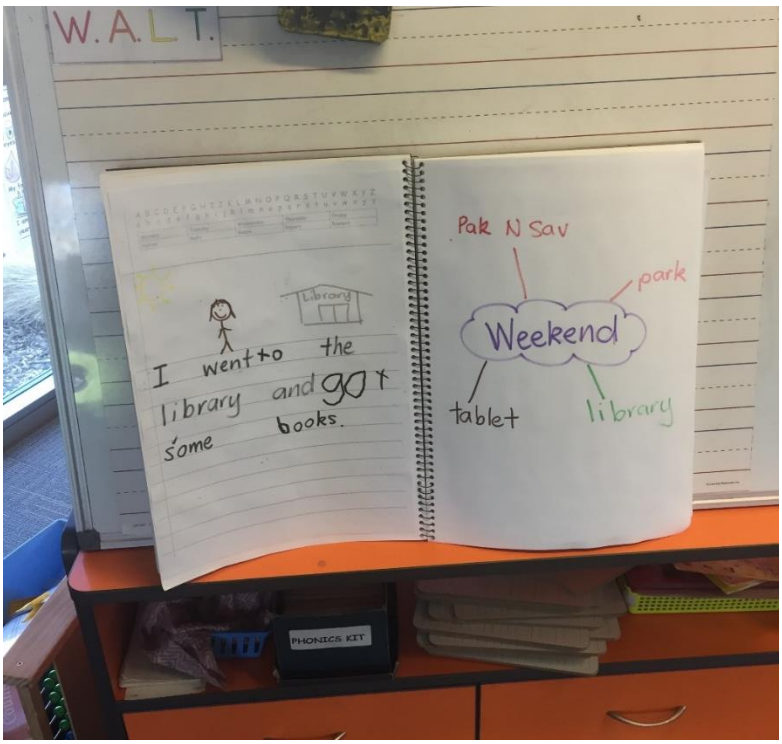


Figure 6a.16: An example of a shared writing task observed in the mat area that is inclusive of a child's weekend experiences, which include use of a "tablet" and going to the library (2018).

The children's classroom studio DT experiences were also accessible and potentially shared in the home environment, which Maria saw as a beneficial transference across settings.

> But then often sometimes we'll hear kids saying, "Oh I found that at home." So they are actually transferring that back and going back and finding that online and that, which is quite cool. (Maria,2018)

As not all children had experience with these digital games, the conversations around such games were limited. In general, it appeared the teachers had limited knowledge on how children were using DT within the home environment, much less the learning opportunities associated to engaging with the DT through play. It was not clear from the interview how this perception of DT contrasted with their mostly play-based approach stated earlier in the interview. Besides the school technician, teachers did not mention an additional person associated to the mainstream classroom studio that supported their use of DT to develop the presence and use of minority languages within the classroom.

In 2018, screenshots of the VLL of the educational setting showed children's voices could be heard using minority languages. Figure 6a.17 shows a blog post of a video including audio of children saying

Talofa [Greetings] in recognition of Samoan language week with children wearing Samoan lei necklaces (faces obscured) (2018). In this example, the children were videoed saying *Talofa* [Greeting] and this video was posted on their classroom studio blog. This is an example of the VLL enhancing the presence and use across the microsystems of emergent bilingual young children across their microsystems.

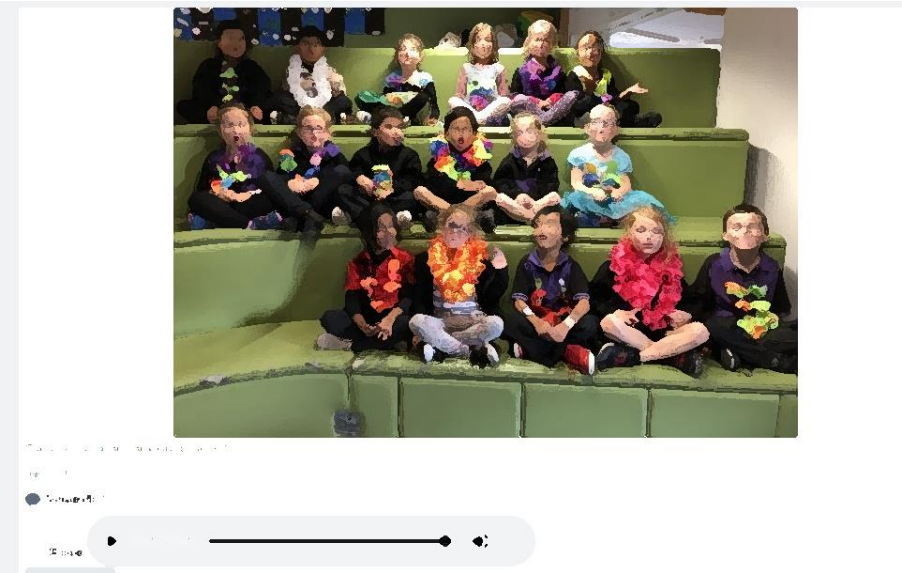


Figure 6a.17: Blog post of a video including audio of children saying *Talofa* [Greetings] in recognition of Samoan language week with children wearing Samoan lei necklaces (faces obscured) (2018).

Sharing children's learning experiences was observed inside the LL of the classroom studio, for example, Figure 6a.14, which included the child's learning experience, the child's voice and the child's creation. In addition there was evidence that the teachers used the LL as a mechanism to engage caregivers in children's learning, with photos displayed on windows to be viewed from outside. The teachers also printed photos for children to take home to share their school experiences with caregivers and family who were unable to visit physically each day. The use of printed photos was helpful for including caregivers who did not have internet access. This supported communication and connection with caregivers in addition to the displays on the walls and face-to-face conversations in the classroom studio.

> We do a lot of photo displays, so things you would put on a Facebook page or on a blog, we tend to just print off, stick on a piece of paper and put in the window, so all the parents can actually have the opportunity to see those photos, rather that feeling like, maybe some don't like coming into the classroom. (Maria, 2018)

There was evidence in the LL of the classroom studio of displays intended to educate caregivers on childhood development and parenting. Figure 6a.18 shows two displays fixed to the windows at adult

head height located at the entrance to PM1, visible to caregivers outside of the classroom. The displays on the value of play in children's development were intended for caregivers (observed in 2018). Given the young age of the children it was common for caregivers to pick up and drop off their children, this generated a larger presence of caregivers within the classroom studio compared to older levels within the school. However, Maria said it was not common for caregivers to seek advice from teachers around the use of DT for educational purposes and her perception was that the majority of the community used the iPad for entertainment. However, in Belle's case, the DT in the home environment was used for multiple purposes including accessing content in minority languages. There was no evidence in the LL or VLL of DT guidance for caregivers within the LL of PM1.

> But, yeah, I don't think with our community here that the iPad is seen as a learning tool, it's pretty much seen as entertainment. (Maria, 2018)

Figure 6a.18: Two displays fixed to the windows at adult head height located at the entrance to PM1, visible to caregivers outside of the classroom. The content of the displays is intended for caregivers on the value of play in children's development (2018).

In 2018, Maria said that there was a growing expression of caregiver concern around children's overuse of DT; she said, "often you hear little things and it's to do with the technology. It's to do with the overuse of the iPads and that sort of thing" (Maria, 2018). The teachers expressed concerns about unrestricted access and the potential impact on children's sleep, as they understood some children had a television in their bedrooms. The teachers shared an example of how one child's older sibling came to the teachers to request support in managing digital technology use in the home.

> We do have [a situation with] one child where the older sister has come in and said to us that he won't do any of his homework or anything like that. He's always on the iPad. [The sister asked] "Can you tell him that he has to do his reading first and he has to listen to Mum and Dad and not be on the iPad" (Maria, 2018).

Other concerns were about children who had a tendency to over use digital technology. Although the teachers were aware that some children needed careful monitoring, they were concerned that some caregivers were letting their child lead their DT use too often.

> There are often parents that will say [their child] will have a meltdown if he doesn't [get to use the technology]. It's interesting seeing them once they walk out that school gate with their parents. Who is in charge? Often you hear little things about our [children] and it's to do with the technology. It's to do with the overuse of the iPads and that sort of thing (Maria, 2018).

Artefact 1 - Where in the world do I come from?

The artefact "Where in the world do I come from?" was selected as the most salient evidence of developmental change in the LL of the classroom studio. This display categorised as multilingual as observed in 2018 (see Figure 6a.12) Figure 6a.19 is the display *Where in the world do I come from?* situated at the entrance [of the classroom studio] with maps, children's photos (faces obscured) with string connecting to their country of origin, flags and corresponding greetings. In 2018, the teachers developed this display with the aim of creating a welcoming space and sense of belonging for children and families to use languages other than English. Languages other than English could be heard within the primary classroom studio, particularly when older children from within the school visited, highlighting the way in which mixed aged interactions could support presence and use of minority languages in the educational setting emergent bilingual young children.

Figure 6a.19: The Where in the world do I come from? display situated at the entrance [of the classroom studio] with maps, children's photos (faces obscured) with string connecting to their country of origin, flags and corresponding greetings in 2018.

This display built on the display of the children's profile display (Figure 6a.4) with basic information, including the child's name, age, eye colour, height and favourite colour. The new display was positioned near the entrance of the classroom studio and included a large map of the world, a map of New Zealand, children's photos, flags and multilingual greetings. Figure 6a.20 shows the *"Where in the world do I come from?"* display showing the map with strings pinned to locations that connect with a child's profile photo (2018). This display coincided with a survey sent home for parents to record children's identities.

> We just asked the parents where they're from and got a photo and strung it up to where they're from. And we've noticed the kids do look at it and see their photo and where they come from and talk about other countries and "This is where I'm from" and the parents have come in too and had a look at it and to see who else is from other countries (Maria, 2018).

Figure 6a.20: The *"Where in the world do I come from?"* display showing the map with strings pinned to locations that connect with a child's profile photo (2018).

With the addition of this multilingual display, the teachers observed more conversational interaction between children, teachers and caregivers. Older students from within the school that regularly visited the classroom studio had also interacted with the display. Older children were observed asking the children in the classroom studio where they were from; many of these children identified shared cultural origins with children from PM1.

> And it got the parents talking because when I had to ask, "Where are you from, can you show me?" It got them talking about their home and what it was like. (Maria, 2018)

When creating the display, conversations about family origins opened up further conversations with families about their home country, personal experiences and the diversity of languages and cultures within the home environment. This display had the potential to continue to develop by incorporating additional language information and cultural artefacts that could strengthen the sense of belonging and celebration of cultural and linguistic diversity in the classroom studio, which teachers were aiming to develop. Figure 6a.21 shows the flags and corresponding greetings featured in the "*Where in the world do I come from?*" display (2018).

Figure 6a.21: The flags and corresponding greetings featured in the "*Where in the world do I come from?*" display (2018).

This multilingual display was supported with regular daily incorporation of multilingual greetings mentioned in the teachers' interview in 2018. Figure 6a.22 is a photo capturing half of the modern learning space of the primary classroom studio in 2018 with Artefact 1 displayed on the far left wall in 2018. At the beginning of each day, the class sang a song with multilingual greetings inclusive of Māori, Samoan, Fijian, Hindi and Mandarin. YouTube was used to support these multilingual practices in the classroom studio via a large internet connected screen. Maria gave me the name of the multilingual greetings song that I viewed later on YouTube. The daily use of multilingual greetings was also

incorporated when the educator called the roll, with some children choosing to use languages other than English.

> And the children, if we do call the roll, they're free to answer in any way. And a few children are starting to use different 'hellos' of the song and that sort of thing (Maria, 2018).

Figure 6a.22: Photo capturing half of the modern learning space of the primary classroom studio in 2018 with Artefact 1 displayed on the far left wall in 2018.

Artefact 1 was an example of the LL supporting the proximal processes within the classroom studio that increased the presence and use of minority languages within the educational setting. The artefact mediated conversations between multiple people from a variety of contexts both within and beyond the school that strengthened the connections between the emergent bilingual young children and their minority language(s) and cultures.

Artefact 2 – SeeSaw e-portfolio System

The second selected artefact was SeeSaw, an e-portfolio system for sharing children's learning introduced in 2018. Figure 6a.23 shows the e-portfolio system Seesaw used in the classroom studio in 2018. The selection of this artefact was evidence of developmental change in the LL and VLL of the

classroom studio environment. The purpose of this section is to illustrate the proximal processes associated to the e-portfolio and its ability to connect the microsystems of the educational setting and the home environment to support the presence and use of minority languages across settings. The function of the app was to enable educators to share children's classroom studio experiences with photos and videos that children and caregivers could comment on. Teachers reported that most of the families had "signed up" (Maria, 2018) to Seesaw online. Teachers posted pictures with captions on SeeSaw to share with families. SeeSaw had translation tools, so if a note, caption, comment, announcement or message was written in a minority language, a "See Translation" option appeared below the post. SeeSaw also had family invitation letters in 10 different languages. At the time of the interview, children in the classroom studio did not have access to this feature. Children's independent use of Seesaw required training guided by adults.

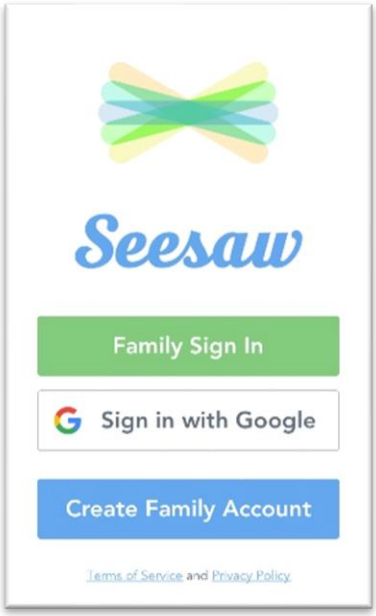


Figure 6a.23: Artefact 2 the e-portfolio system Seesaw used in the classroom studio in 2018.

> Sometimes we'll ask the children whether they've seen it so, I doubt if the parents are necessarily showing the children everything that's on Seesaw because at the moment we are posting everything up onto Seesaw. But, lots of them talk about the iPads and the tablets so, there's definitely [access to technology at home]. Or they're on their parent's phones and that sort of thing. There's still a few in our class that haven't connected to Seesaw but most of them have (Maria, 2018).

Posts to Seesaw were also copied and published on the classroom studio blog, accessed through the school website and was publicly visible. Cultural celebrations were also shared, such as the celebrations for Samoan language week. Various functions on the SeeSaw App allowed educators to communicate either to individual caregivers or to a group.

> Well, it's all so, Seesaw works where we can post stuff just for individual parents to see things or we can post it for everyone to see and then we can make it onto the blog so that anybody can see it. (Maria, 2018)

The aim for future use of the SeeSaw App was for children in the classroom studio to share their studio learning with their caregivers independently via the app, this independent use would be without educator assistance. The SeeSaw app was used throughout the school, with older children more competently sharing their learning via the app. A limitation on independent use of the app was the children's young age and their need for teaching time on how to use the app.

> It's designed so that children can use it and share their work with their parents. But it's about training the kids how to use it, which is a little bit tricky at this age. But further through the school, they do do that. (Maria, 2018)

The SeeSaw app created a connection between the educational setting and the home environment through the sharing of children's learning during the day, most of which were through photos and captions. The design of the app enabled caregivers to make comments as a response to the posts. The educator saw a good level of engagement from caregivers, which Maria perceived as positive, but inferred that that there was no expectation for caregivers to respond in minority languages as their responses via the SeeSaw app were "obviously in English" (Maria, 2018).

> But what we're posting on it is pretty much just pictures with a little caption of what their children are doing. But, that's really cool. But lots of them, I mean, they're responding but obviously in English. (Maria, 2018)

Summary of Case One

The aim of this case was to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that supported the presence and use of minority languages within the LLs and how the LL of the educational setting developed after approximately one year. This mainstream primary classroom studio was set within a newly constructed primary school

serving an ethnically diverse community of Year 0 to Year 8 children. The visible welcoming of ethnic diversity was observed on the school website with the homepage leading with a multilingual greeting in nine different languages (Figure 6a.1) in year one and two of data collection. English was the dominant language within the LL of the classroom studio (Figures 6a.4, 6a.6, 6a.8, 6a.13, 6a.14, 6a.15 and 6a.17) with Māori language increasing in presence from 2017 to 2018 (6a.112). The presence of Māori language within the LL was reflective of some of the Māori language used in daily routines and practices (Figure 6a.7). A LL report was produced for the educator's review in 2017. The LL report prompted educator reflection on the presence and use of minority languages within the educational setting. In 2018, the LL had developed with a reduction of English only displays and the development of a large multilingual greetings display at the entrance of the classroom studio (Figures 6a.19, 6a.20 and 6a.21). This display consisted of maps, flags and greetings with strings connecting to photos of children and their family to indicate their ethnic identities. This display was selected as an artefact along with the e-portfolio app (Figure 6a.22) introduced into the mainstream primary classroom studio in 2018.

The home environment of Belle, the caregiver in this case, was multilingual. Interactions in multiple languages were with immediate and extended family, both physically and virtually. Both Belle and her husband spoke Cantonese in the home and each had their own Chinese dialect, which they used with their own parents. Regular contact was made with their parents who had also migrated to New Zealand and lived within close proximity to the home. Belle had two children, one attending the mainstream primary school in this study (Lucia) and a younger sibling attending a mainstream ECE. Belle said both children had acquired English language communication skills from within the educational setting. Lucia's fluency in English was developing and Belle said this was now more developed than her Cantonese, which was the main language used within the home environment. Although Belle had a strong motivational force to ensure her children continued to develop Cantonese, as Cantonese was the only language for connecting with some extended family members, she expressed concerns about her ability to ensure the children did not lose their minority languages.

The home environment had a range of DT devices connected to the internet. The internet-connected television screen could access content in Cantonese and Mandarin and Belle encouraged her children to watch cartoons in Mandarin. Despite access to multiple devices with simple applications, Lucia preferred to use her mother's phone. The children's most regular activity on DT was watching YouTube. Belle observed how the YouTube videos coincided with the child's imaginative play with topics straddling the virtual and physical words, which contradicted the teachers' perceptions of how DT was being used in the home. DT was also used to connect with extended family in China, enabling

Belle to communicate in multiple languages and increase the presence and use of minority languages within the home environment. The children's DT use was not without concern, as Belle considered her child's use as "too much" and she was concerned that such overuse could damage her eyes. The language environments of the home and educational settings appeared to be linguistically distinct. Belle had not observed any practices within the mainstream primary studio that would support her child's use of Cantonese at school. Although Belle said she felt that her children had a sense of belonging within the educational settings, interactions were in the English language only and excluded their multilingual identities, in particular Lucia's Cantonese name written in Chinese characters. Belle said she could interact with her children in Cantonese in all external environments beyond the home and educational settings but also mentioned that she reduced her volume to make speaking in Cantonese more discreet in English dominant environments. A possible limitation of this case study is potential misinterpretations or limited explanations due to the interview with Belle being conducted in English only. Therefore, quotes from Belle were presented verbatim where a clear meaning could be established from the quote. In addition, it is useful to note that Belle was fluent in at least two languages, Cantonese and her family dialect, therefore her interview data was likely to have been more extensive and differ had it been conducted in one of her first languages.

Two artefacts were selected to describe in more detail. Teachers developed Artefact 1 in 2018, which made multilingualism and multiculturalism more visible within the studio (Figure 6a.19). This display included children's profile photos, strings to connect them to a map of the world, and international flags with associated greetings. This display also supported classroom studio practices incorporating multilingual greetings. The construction of the display stimulated conversations with children and their families about their culture, heritage and language use. This display also mediated interactions between older children within the school and children in the classroom studio who shared similar languages and countries of origin. This development in the LL appeared to be supporting the children's sense of belonging within the classroom studio in a way that included the children's cultural and linguistic identities and resources. Artefact 2, the e-portfolio SeeSaw introduced in 2018 (Figure 6a.22), enabled the educators to communicate children's learning across the microsystems of the educational setting and the home environment. The bidirectional capabilities of the app enabled caregivers to respond to their children's learning in their minority languages, although evidence of this was not found in the data. The interactive functions of the e-portfolio had potential for caregivers to incorporate minority languages in responses, therefore shifting power and direction of the proximal process and strengthening the home/school network. The proximal processes, framed through the LL, indicated that the welcoming of linguistic and cultural diversity increased over the two years in this

study, from being visible on the school website in 2017, to multilingual greetings seen and used in daily practices in the classroom studio in 201

Conclusion

This was an in-depth illustrative ethnographic case study of the linguistic landscape of the reception Year 0/1 classroom studio in a mainstream primary school of an emergent bilingual Chinese 5-year-old child who attended in 2017. This case study was interpreted through the Bioecological Systems Framework using the Process-Person-Context-Time (PPCT) model with home, school and community networks to support language development. The microsystems in this case were the educational setting and the home environment of the child, interconnected using DT and virtual linguistic landscape (VLL) associated with the educational setting. In this case, the microsystems of the educational setting and home environment were linguistically distinct. The LL of the mainstream primary studio was mostly in English with some Māori language presence and use, and support networks predominantly focussed on English and Samoan. The presence and use of minority languages developed as observed in 2018 in the LL and VLL, platforms of which were mostly controlled by the educators. In contrast, the child's home environment with close extended family connections exposed Lucia to multiple languages within the home. Lucia used English and Cantonese and was encouraged and supported to learn other family languages, many of which were accessed through books, television and YouTube. The child's main activity on the DT was viewing YouTube, watching videos associated to the child's interests and mediated imaginative play, which could be accessed through all the other devices in the home, the content of which were mostly controlled by the child.

In 2018, a large display with maps and multilingual greetings was new to the LL (Figure 6a.19, 6a.20 and 6a.21). This display welcomed cultural and linguistic diversity within the mainstream primary classroom studio environment and mediated bidirectional proximal processes within the classroom studio between educators, caregivers, and older students in the school, which strengthened the presence and use of minority languages and associated relationships. The e-portfolio (Figure 6a.22) introduced to the classroom studio in 2018 had enabled bidirectional proximal processes as educators could share children's learning with caregivers.

6b. Case Two – Mainstream Early Childhood Education Centre (CM2)

The educational setting and home environment of an emergent bilingual 4 to 5-year-old Māori child

This is an in-depth illustrative ethnographic case study of the *linguistic landscape* (LL) of an emergent bilingual young child's educational setting interpreted through the Bioecological Systems Framework (Bronfenbrenner, 2005). The Bioecological Systems Framework is conceptualised using the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007) with contexts networked through direct and indirect social interactions. The microsystems in this case are the educational setting and the home environment of the emergent bilingual young child, interconnected using *digital technology* (DT) and the *virtual linguistic landscape* (VLL) associated with the educational setting. Mesosystem interactions of interest are between the child's educators and caregiver. The educational setting in this case study is a mainstream Early Childhood Education (ECE) centre (CM2) of an emergent bilingual Māori 4 to 5-year-old child who attended in 2016. This case study draws on ethnographic observations of the LL (physical and virtual) of the educational setting, interviews with educators and one caregiver, review of associated documents, and the researcher's journal. The aim of this case is to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that support the presence and use of minority languages within the LLs of emergent bilingual young children, and the development of the LL of the educational setting after approximately one year.

Introduction

I arrived outside of the ECE centre in September 2016. I was familiar with the centre and had a short period of involvement as a parent in the past. As I walked in, I was led along a pathway framed with decorative archways displaying Māori inspired design set amongst established green planting. To me, this walkway felt similar to walking through the traditional Japanese gates called *torii*, a row of red arches to signify that the person is entering into a sacred space. The pathway and entrance communicated to me that I was entering a space that did seem sacred. The symbols and design of this pathway indicated to me that Te Ao Māori and our connection to nature were valued. Figure 6b.1 is the main entrance pathway leading to the centre and the outdoor playground (2016), with Māori inspired design on the vertical posts and planted with native flax and grasses.

Figure 6b.1: The main entrance pathway leading to the centre and the outdoor playground (2016), with Māori inspired design on the vertical posts and planted with native flax and grasses.

The Early Childhood Centre (ECC) was situated in the same Community of Learning as Case Study One, serving vulnerable communities with many low socio-economic families and single-parent families (Statistics New Zealand, 2013). The centre was set in a part of the city where Samoan, spoken by 6.6% of people, was the second most widely spoken language after English (Statistics New Zealand, 2013). More people in this community spoke Māori (3.7%) compared to the entire city (1.8%). In the 2018 census, the number of Māori language speakers in the community increased up to 10.5% in the north of the community and Samoan speakers increased to 6.4% in the south of the community (Statistics New Zealand, 2018). This centre was licensed for up to 30 children over the age of two years. There were three full time fully trained ECE teachers and one equity teacher. The additional equity teacher was funded by the Ministry of Education through criteria met based on census and demographic data. The funding was to increase educator/child ratio to support Māori and Pasifika children.

> Equity funding provides additional targeted funding to make early learning opportunities equally available to everyone. It also helps services to raise educational achievement regardless of people's cultural background, socio-economic status or location. (Ministry of Education, 2019)

The centre was one of up to 70 ECCs in an organisation, therefore many procedures and practices were guided by the broader policies of the organisation. An example of this was the organisation's management of their website and Facebook page. Information and notices relating to the centre for online publication were communicated via the organisation's leadership team. Figure 6b.2 is a screenshot of the centre's organisation home screen with Māori and English (2016). On the

organisation's website, particularly the home page, the VLL was bilingual with a Māori greeting and whakatauki [Māori proverb].

Figure 6b.2: Screenshot of the centre's organisation home screen with Māori and English (2016).

The centre did not have a Facebook page but teachers were able to make posts on the Facebook page of the organisation, which also featured posts from other ECE centres within the organisation. Posts were inclusive of multiple languages and celebrationsof cultural events and protocols, such as the celebration of *Matariki* [Māori New Year] showing preparing and sharing food together. The organisation had set up a support group through their Facebook "Where, if there is anything [for example] notices, [parents] can tell each other" (Cath, Head of Centre, 2016).

The centre had no official written or published centre policy specifically on language and was following Te Whāriki - He whāriki mātauranga mō ngā mokopuna o Aotearoa Early Childhood Curriculum Document (Ministry of Education, 2017), a bilingual document that draws upon traditional Māori concepts that underpin the philosophy of Kōhanga Reo [Māori immersion ECE}. Māori concepts are interwoven into the principles and learning strands of Te Whāriki, with Māori terms and cultural design visible throughout the document. The principles are *Whakamana* [empowerment], *Kotahitanga* [holistic development], *Whānau Tangata* [family and community] and *Ngā Hononga* [relationships]. The document acknowledges *Te Tiriti o Waitangi* [The Treaty of Waitangi] as the founding document, and articulates the responsibility of education to not only provide equitable outcomes for Māori children but to take responsibility for Māori language revitalisation. Figure 6b.3 is the display of the Treaty of Waitangi in Māori and English in the whānau corner of the centre (2017).

Figure 6b.3: Display of the Treaty of Waitangi in Māori and English in the whānau corner of the centre (2017).

6b.1.1 People

I had been in contact with the Head of Centre (Cath) via email to arrange my first interview with her. Our email communication had included Māori greetings, so my expectation was that incorporation of Māori language occurred naturally and across other forms of communication. Table 6b.1 provides a description of educators and caregivers, their pseudonym, ethnicity and languages. The key people in this case study were **Cath** and **Jade**, as the educator and caregiver of the emergent bilingual young child, **Manawa**. Interview data from the other teachers and caregiver was incorporated in the findings when it related to Cath or Jade and/or interactions with the developing child. I interviewed Cath again in the second visit approximately one year later.

Table 6b.1

Description of participants in Case Two – Mainstream Early Childhood Education (Pseudonyms in bold).

Participants Pseudonym	*Relationship to child*	*Ethnicity*	*Language(s)*	*Family*
Head of CM2 (**Cath**)	Head of centre and experienced ECE teacher	NZ European	English and used Māori language within the centre	
Teacher C1A (Sally)	Experienced ECE teacher	NZ European	English and used Māori within the centre (Equity teacher)	
Teacher C1B (Tania)	Experienced ECE teacher	NZ European	English and used some words from additional languages including Māori	
Parent C1A (**Jade**)	Mother	NZ European	English and used some Māori words	Māori partner and two children, eldest (**Manawa**) in the ECE centre

Jade identified herself as a New Zealand European mother with two children, one of whom attended the centre, Manawa, and a toddler not enrolled at the centre. She was a stay-at-home mother with a partner employed fulltime, who was of Māori descent with both his parents identifying as Māori. Within the home environment, Jade spoke English and only occasionally used Māori words; she appeared motivated to learn and incorporate more Māori language into their daily interactions. Jade viewed learning Māori language as a necessity for her children as she said she believed it would be beneficial for them, particularly in relation to their cultural identity, as both her children were identified as being part Māori.

> I will need to learn the Māori language as well because that part Māori it would be good for them to learn that. (Jade, 2016)

6b.1.2 Networked contexts in Case Study Two

The microsystems of the caregiver and teachers in this case networked with other people, contexts and systems interconnected using DT, which influenced the presence and use of languages across multiple contexts. Figure 6b.4 illustrates a visual representation of the networked ecological systems in this case. This visual representation is based on Neal and Neal's (2013) Networked Model of Ecological systems. Hypothetical direct and indirect social interactions illustrate the proximal processes over time, interconnected with the DT. Additional adults and associated organisations were connected to the ECE, and these networks engaged with Jade and her child to support the presence and use of Māori language and culture. Wider exosystem and macrosystem influence the developing child within the educational setting. Microsystem contexts mentioned in the educator interviews were the national Early Childhood Curriculum document Te Whāriki, and Tātaiako (Education Council New Zealand–Matatū Aotearoa, 2011), an additional Ministry of Education document regarding cultural competencies to support engagement and relationships with Māori learners and their whānau, and support systems including organisations within the community.

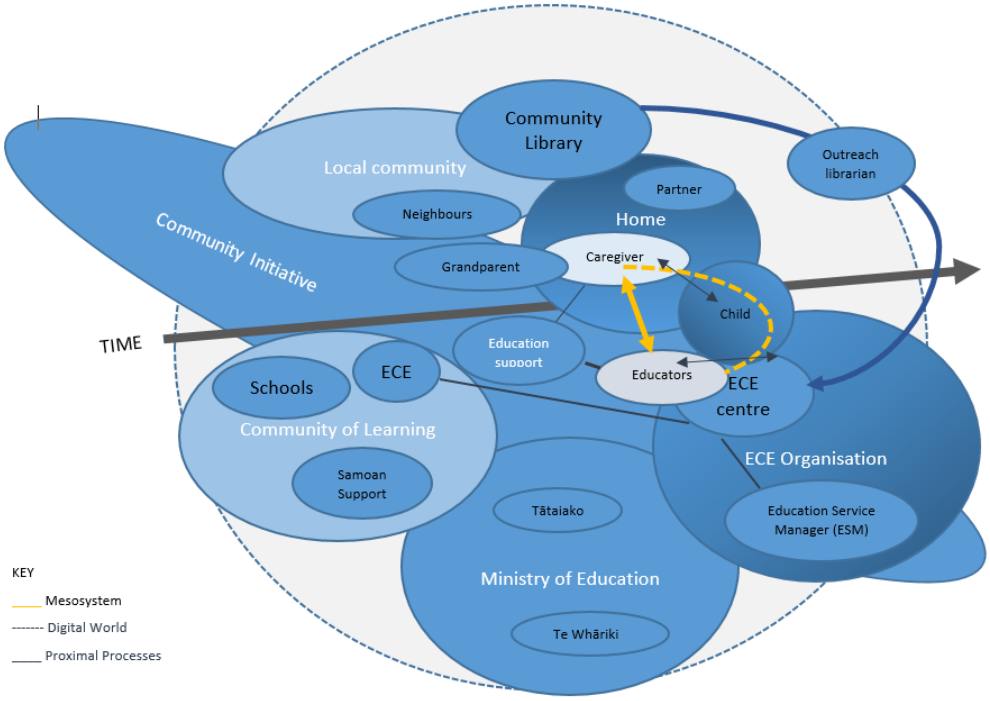


Figure 6b.4: A visual representation of the networked ecological systems in this case. Based on Neal and Neal's (2013) Networked Model of Ecological systems. Hypothetical direct and indirect social interactions illustrate the proximal processes over time, interconnected with the DT.

The Education Service Manager (ESM) of the ECE organisation provided strategic oversight to ensure consistency of quality in curriculum delivery across the ECE centres in the organisation. On several occasions, I had met the centre's ESM at CM2, so concluded that the ESM regularly engaged with the centre. An example of guidance provided by the ESM was the development of the place-based education approach observed within the LL of the centre.

The centre incorporated the guidelines of the Tātaiako document (Ministry of Education, 2011) outlining cultural competencies into its vision by using more Māori terminology within the centre environment. Figure 6b.5 shows the display of Tātaiako cultural competencies and the Samoan Faletele in the whānau corner of the centre alongside other information for caregivers (2017). Cath, the Head of Centre, acknowledged the bicultural responsibilities within the Treaty of Waitangi and added, "we are multicultural" (Cath, 2016), implying that other cultures would get that same respect. Other informing documents, guidelines and agencies referenced in the educator interviews were the Pasifika Education Plan (Ministry of Education, 2013), Teaching Council New Zealand, Education Review Office and the Fausiga o le Faletele model (Luafutu-Simpson, 2011) visualising Samoan cultural

values. Figure 6b.5 is the display of Tātaiako cultural competencies and the Samoan Faletele in the whānau corner of the centre alongside other information for caregivers (2017).

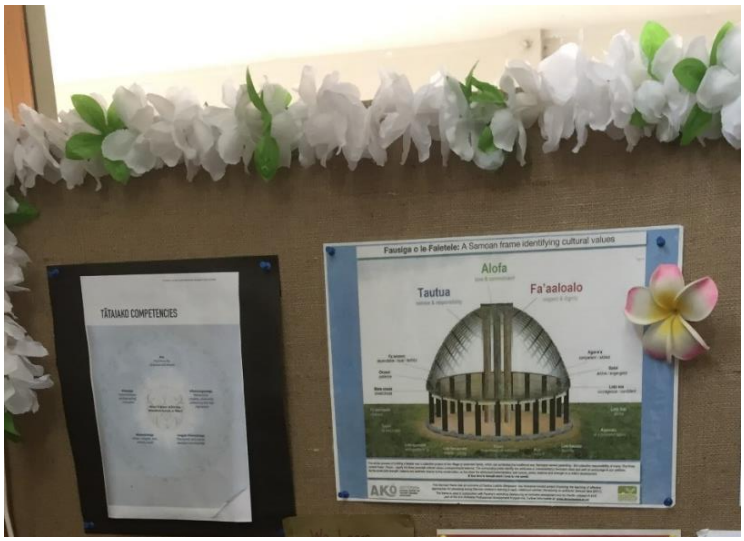


Figure 6b.5: Display of Tātaiako cultural competencies and the Samoan Faletele in the whānau corner of the centre alongside other information for caregivers (2017).

You Matter to Us (Kingston & Dobson, 2019) was a local community initiative coordinated by the Ministry of Education with up to 40 agencies, which in 2017, Cath said were "linking through their heart and not their business head" to come together to engage with the high needs community at a community level. The initiative included health and social service agencies, along with educational services. Cath said, "[it] doesn't necessarily create a space for people to use their first languages, but many Māori families want to reconnect with their heritage" (Cath, 2016). An integral part of the community initiative was the inclusion of the whānau voice, an aspect that Cath believed has the potential to incorporate first language interactions in a community context.

> In the project, there is a whānau voice, which will guide the project, so first language could come. But this would require other people to create opportunities. (Cath, 2017)

The community initiative connected with the education sector of the local tribe in the area, heritage related information could be passed on to families wanting to access this information. Children's tribal connections were displayed within the centre with their portfolio pictures on a map of New Zealand with Māori place names. Figure 6b.6 is the display *He aha to iwi?* What is your tribe? This display includes children's photos (faces obscured) and tribes placed on *te whāriki* [woven mat] with a map

of Aotearoa New Zealand and place names in Māori (present in 2016 and 2017). This reconnection was considered foundational for supporting Māori language development within the centre.

> But for families, they are dealing with historical issues. To overcome, to revisit culture and heritage [a representative] from [the local tribe] and the teacher has been able to pass on information for the family to access information through the education [support] of [the local tribe]. Reconnecting needs to occur before language can be supported. (Cath, 2017)

Figure 6b.6: He aha to iwi? What is your tribe? Display with children's photos (faces obscured) and tribes placed on *te whāriki* [woven mat] with a map of Aotearoa New Zealand and place names in Māori (present in 2016 and 2017).

The teachers at the centre developed connections with the community initiative to strengthen connections at a community level. Cath's empathy for the historical issues affecting current language and cultural disconnection was an additional driver for active whānau engagement with the intention to provide additional support for caregivers to access community initiatives designed to provide health, social and educational support. This establishment of connections that extended beyond the microsystem of the centre for improved developmental learning outcomes of the child adopted both

a holistic view, and one that considers the historical factors implicating the development of a child's minority language.

The outreach librarian from the city library was an additional support for the centre and visited regularly to share books (physical and digital) with the children at the centre. Primarily, this was for promoting the library services, which included online borrowing of e-books. The interactive sessions included a range of iPad applications that incorporated minority languages. The outreach librarian was also an additional person to support the development of DT use within the centre, planned to provide professional development and recommendations for educators.

> The library is very good [the outreach librarian], she will say this [iPad application] is a good one because she has researched it all. She is wonderful for all of those kind of resources that would be definitely something that we would want to take on board. (Cath, 2016)

6b.1 The ECE Linguistic Landscape in 2016

I progressed further along the path and I stopped and took in the surrounding area in 2016. The centre consisted of one building and a large outdoor play area that overlooked a large public park area. The outdoor play area contained established trees and there was direct access from the centre building, which overlooked the play area, to the outdoors. At the end of the path, I encountered a noticeboard displaying photos of children's family pets. Figure 6b.7 is the noticeboard outside of the centre at the end of the main pathway entrance and before entering the building porch. The display changed regularly with photos of children's pets displayed in 2016. Caregivers were asked to email photos to the centre to be printed and displayed.

It felt like I had not quite entered the educator's domain officially, so the noticeboard in this shared space of the outdoor play area with content including children's home environment, felt genuinely like a shared space, with the teachers offering to print out photos for families via email. Positioned at the end of the pathway, it reinforced that the intended audience of this display was arriving children, families and visitors. I felt I had time to look over the display, as if I was still in neutral territory and had not quite entered the domain of the educators.

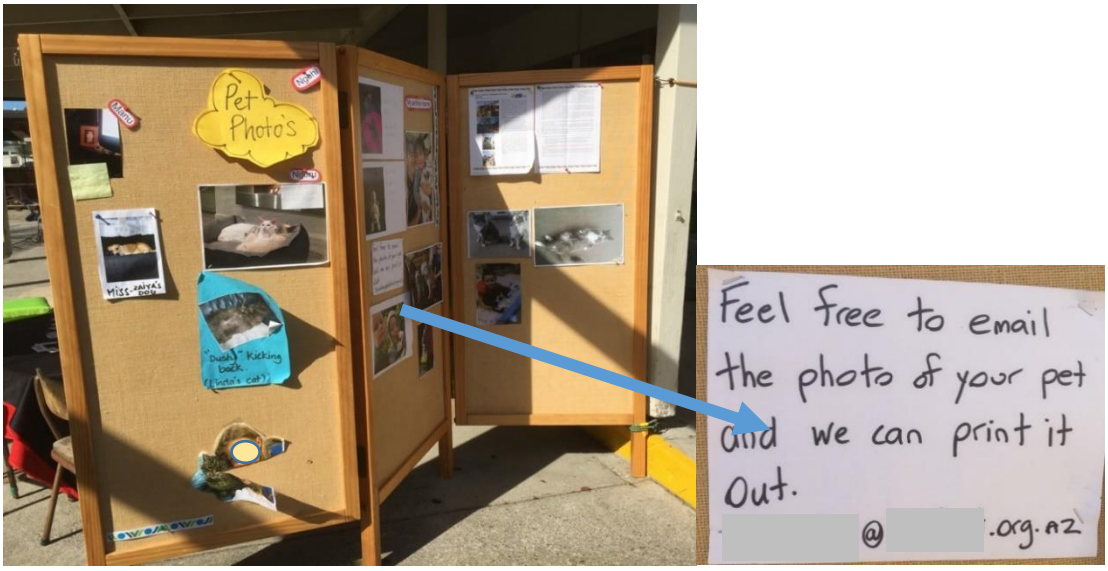


Figure 6b.7: Noticeboard outside of the centre at the end of the main pathway entrance and before entering the building porch. The display changed regularly with photos of children's pets displayed in 2016. Caregivers were asked to email photos to the centre to be printed and displayed.

I stepped into the outdoor covered entrance. In the outdoor covered entrance there was a large whiteboard with greetings in multiple languages and a range of notices for caregivers. Figure 6b.8 illustrates the whiteboard noticeboard outside the main entrance of the centre with handwritten multilingual greetings in 8 different languages 2016. I thought the handwritten greetings personalised the welcome and the impermanent nature of the whiteboard gave me the impression that the greetings were freshly written, which gave the greetings an active feel. Through the LL I could see that it was not only Te Ao Māori and connection to the outdoors that was valued, it was the people, their cultures and their languages that were also held sacred.

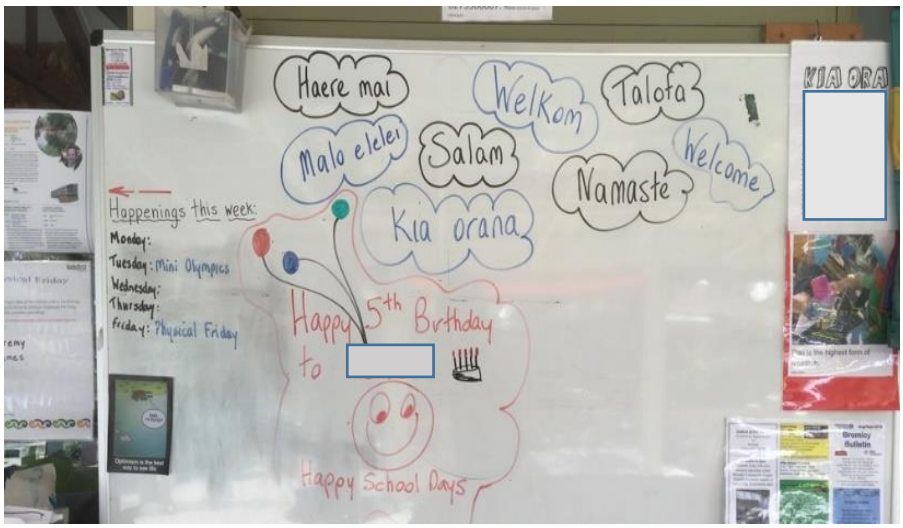


Figure 6b.8: The whiteboard noticeboard outside the main entrance of the centre with handwritten multilingual greetings in 8 different languages 2016.

The ethnic composition of the centre was New Zealand European, Tongan, Samoan, Persian, Nepalese, South African, Cook Island, Māori and Fijian children. All the teachers at the centre identified as New Zealand European and the teachers interviewed said they were strengthening their knowledge and use of Māori and Pasifika languages. The centre had a high ratio of boys to girls. I signed in outside the open entrance door, which displayed a permanent multilingual greeting published by the centre's organisation. Figure 6b.9 is the multilingual greetings poster published by the organisation and observed in other ECCs. This poster was displayed on the window of the main entrance door to the centre (2016).This poster indicated that the value of welcoming multilingual children and their families was shared across the organisation, as I had observed the poster displayed in other ECE centres associated with the organisation.

Figure 6b.9: A multilingual greetings poster published by the organisation and observed in other ECCs displayed on the window of the main entrance door to the centre (2016).

Although the LL of the centre had visibility of Māori language throughout the centre, the most common language visible was English, which was to be expected, as English was the primary language of instruction in the mainstream centre. This was similar to early LL findings from other mainstream ECC in the same community area (Harris et al., 2017).

In 2016, I took 43 photos of all the wall displays in the centre, or a representative part of a display, to produce this linguistic landscape. Figure 6b.10 gives an overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the centre 2016 (n=30).

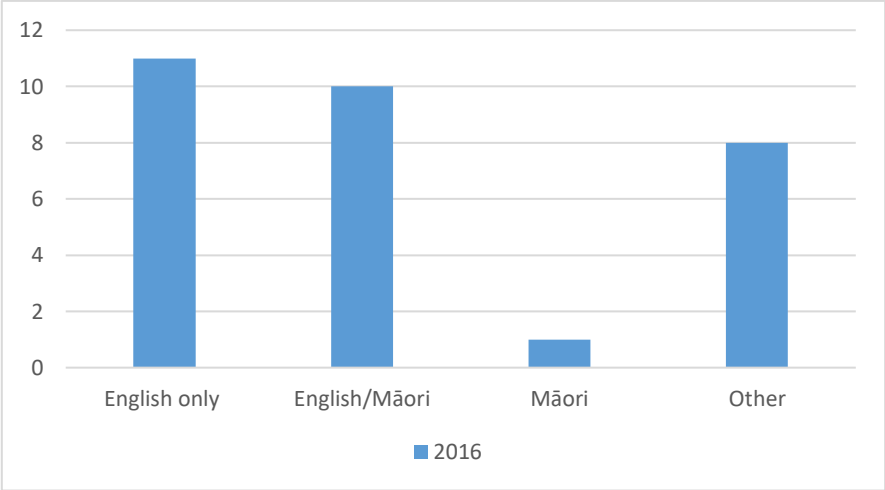


Figure 6b.10: An overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the centre 2016 (n=30).

Thirty photos contained linguistic items. Seventeen of the 30 photos were of displays that contained some level of Māori, of which one photo was in Māori only and one was in mostly Māori. Five photos contained Samoan and four other photos included other Pasifika languages. Two permanent displays contained greetings in multiple languages, a publication from the organisation in 21 different languages and handwritten greetings on a whiteboard at the entrance of the centre in Māori, English and six other languages. In the centre there were also 12 images representative of people or items from various cultures.

6b.2.1 Educational Setting Proximal Processes in 2016

Proximal processes (Bronfenbrenner & Morris, 1998) are direct interactions with people, objects and symbols, that drive development and occur within a larger ecological system where interactions between and across systems are reciprocal and mutually influential. The proximal processes identified from interview data illustrate the interactions within the microsystem of the mainstream ECE centre that relate to the presence and use of minority languages. Use of minority languages was mostly limited to Māori and then Samoan, evidence of this was the incorporation of Māori words in displays that mediated daily routines, such as *kai* [food] time, *whānau* [family] time and referring to the

educators as *kaiako* [teachers]. DT within the centre was limited, with preference for developing children's social-emotional skills in the outdoor environment. Interactions with DT occurred between educators and caregivers as a means for strengthening the home and educational setting connection.

Presence and use of minority languages in the educational setting

The teachers said they were aware of the cultures and languages the children were speaking at home. To increase the visibility and presence of minority cultures and languages within the centre environment, Cath reported that she asked herself "What is it that I could put out to show that cultures are valued and recognised?" Developing a welcoming environment took time and involved interactions and connections with family members to build relationships. Cath emphasised that a part of the centre philosophy was to have caregivers engage in the learning programme, and teachers put effort into welcoming caregivers into the centre. The welcoming of diversity within the LL took a variety of forms, with decoration including cultural artefacts, cultural symbols and designs. Figure 6b.11 are examples of the multilingual greeting display (child height) and welcome sign in Fijian decorated with tapa cloth, flowers, plants and cultural artefacts.

> We're working really hard on getting parents through the door as part of our philosophy is having parents engaged in what is happening because without them being on board we're not going to be able to create the learning outcomes for the children. (Cath, 2016)

Figure 6b.11: A Multilingual greeting display (child height) and welcome sign in Fijian decorated with tapa cloth, flowers, plants and cultural artefacts. The image on the right is indicative of the centre's values of interconnecting diverse people, language and nature (2016).

Tania, an educator in the centre, said that along with use of the greetings, at times teachers would go one step further to speak some other phrases in languages other than English. Tania stressed the

importance of not only making minority languages visible within the environment, but also that languages needed to be heard in authentic interactions.

> Using the greetings and maybe go that one-step further with some other phrases that you've [learned]. It's really important [the children and their families] hear their language spoken, not just see things on the wall like a Tapa cloth but it needs to be authentic, so spoken. That's how we make those connections taking some time out to talk with people and get that relationship. Because the relationship is all. You can't then go handing out forms and all this and that and want an authentic response. (Tania interview, 2016)

This indicated that the LL was reflective of proximal processes involving authentic use of minority languages within the centre, and the authenticity of these proximal processes strengthened relational connections with minority families. In addition, the development of relationships and engagement with minority families supported educators in incorporating minority languages into the LL of the centre. However, not all families had the linguistic or cultural resources available to support the presence and use of their own minority languages in the LL of the centre. Cath said she recognised that Māori was not so strong among families so "that is why it's important to embed it in our practice" (Cath, 2016). Māori language use within the centre was intertwined into daily routines with regular and ongoing use of *waiata* [songs] (Figure 6b.13 and Figure 6b.14), *karakia* [prayer], *kupu* [words] and *whakatauki* [proverbs]. Figure 6b.12 shows the Waiata [song] lyrics in Māori, English and Samoan displayed from the ceiling opposite the mat area for teachers to refer to during mat time (present in 2016 and 2017 and photos from 2017).

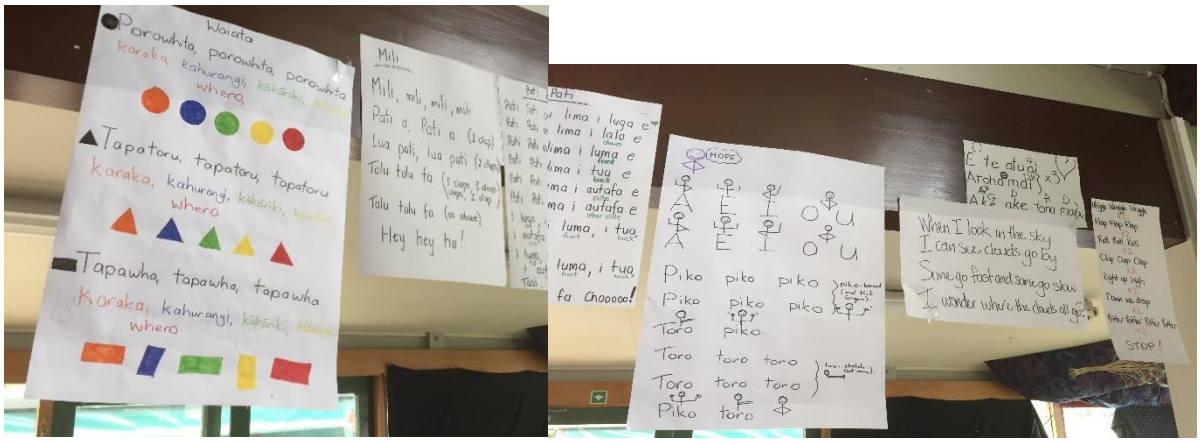


Figure 6b.12: Waiata [song] lyrics in Māori, English and Samoan displayed from the ceiling opposite the mat area for teachers to refer to during mat time (present in 2016 and 2017 and photos from 2017).

Samoan language was also observed in the LL indicating Samoan language was also embedded to a lesser extent. Samoan language was observed in song lyrics displayed in the mat area of the centre. Figure 6b.13 is the *Savalivali* song lyrics displayed on the wall in the mat area of the centre (2016 and 2017) featuring Samoan language and English.

Figure 6b.13: Savalivali song lyrics displayed on the wall in the mat area of the centre (2016 and 2017) featuring Samoan language and English.

In addition to embedding minority languages, there was evidence from educator interviews of practices that empowered emergent bilingual young children to incorporate translanguaging into their play. In the excerpt given by Tania, she explains the power of symbols and shapes, as objects for retelling popular fairy tales, to mediate children's use of their minority language(s).

> Something I've found over the years is really key is symbols and shapes and how they can be used as a universal language. Traditional fairy stories and children who have English as a second language they ask me tell me again, tell me again. We have children here who speak Farsi, Tongan, Samoan, and Nepalese at home. These are the children that keep coming to me wanting. Isn't that interesting? I have magnetic stories that they can retell themselves in their own languages. So I might read the story of the gingerbread man and I see this interest in these children who English as a second language. Then giving [the magnetic story] to them as their plaything, because we've got a laminator and it doesn't matter if they get lost. We give up ownership of that because it might get lost or it might go in their school bag, that means that it's important to them. So that's just something that I'm really excited by at the moment and really find very interesting. (Tania, 2016)

Interacting with digital technology and the virtual linguistic landscape

The centre had computers, four iPads (two for educators and two for students). The teachers used the iPad mostly for researching music to play on Spotify, a digital music service. Cath did not specify if these songs included minority language and while I was there, classical music was playing. The two iPads for children had educational games with some level of interactivity. The educational activities described by Cath suggested they were in English only with no mention of the inclusion of minority languages. Cath said she "liked the idea of talking books" (Cath, 2016) as it created another medium for sharing books with the children. The centre was seeking professional development support from the outreach librarian. The limitations with the iPads were the lack of funding and limited time for professional development on purposeful use of DT, such as optimising the use of e-books with interactive functions (see for example, Korat et al., 2014; Hoffman & Paciga, 2014; Smeets & Bus, 2015). The centre also had digital cameras that were mostly used for children's learning stories. One camera in the centre was for the children to take on trips outside of the classroom; however, cameras had been stolen in the past. In general, developing children's digital literacy was not a priority for teachers as the emphasis of the learning programme was on building children's emotional literacy. Attention on developing children's digital literacy could only occur occasionally, as it was dependent on the educator-child ratio and further professional development.

> I use YouTube a lot with the children. We use iPads here and I've got interactive games. One thing I do find, and I've talked to the library and about this, we've got the outreach program with the librarian, because I'm always complaining and whinging to everyone, how so many of the apps are in American language or English. Still to this day! She said, you're right. When we looked through there is only a few with the New Zealand [accent.] So, I think that's quite interesting because a lot of our TV programs, the children of hearing a lot of American. (Tania, 2016)

The centre had no formal written or published policy around the use of DT in the centre. There were however, guidelines around safety and use of DT at the organisational level. The low level of DT use was an emerging informal policy and aligned with the centre's priority for developing children's emotional literacy, playing outdoors and the importance of incorporating nature into the indoor environment. Due to purposeful limitation of DT use within the centre, an emerging informal policy incorporated the consideration of children's social and emotional wellbeing. Cath advised caregivers of expert opinion which was "a definite no, no to two and under. They should never ever be near anything like that". Cath said she was not sure where she had read that information. Despite seeing the potential for DT use, Sally, a centre teacher,said a priority need for the children was to create a deeper level of engagement within the outdoor environment, especially considering that some children may often use DT in the home environment.

> I know you can have relationship-based workaround [DT] but I think a lot of these children are already spending quite a bit of time on it at home and I think for these children being engaged and working at a deeper level outside as much [as possible is] much more important [than] I think technology is. (Sally interview, 2016)

Artefact 3 - Nature

In 2016, many connections to nature were visible throughout the LL in the centre. Cath said that much of their effort to incorporate nature was based on their need to support children's self-regulation of emotions, increase their engagement and develop children's social competencies. Emotional literacy and children's emotional self-regulation was supported through the creation of a more natural environment in the centre. Strategies to support children included reducing artificial light to lower stimuli in the centre and teaching relaxation strategies to children. The educators at the centre took opportunities to undertake activities outside, for example, time observing their natural surroundings; activities were also brought inside to become a part of the LL. Figure 6b.15 shows a clipboard with an educator's description of activities involving children, "Discovering the Natural World that surrounds us". Educators and children sat outside picnic style to eat together, to increase children's daily time in nature. Eating routines enabled educators to actively take charge and "sit down together to relax, eat and connect" (Cath, 2016) outside in the natural environment.

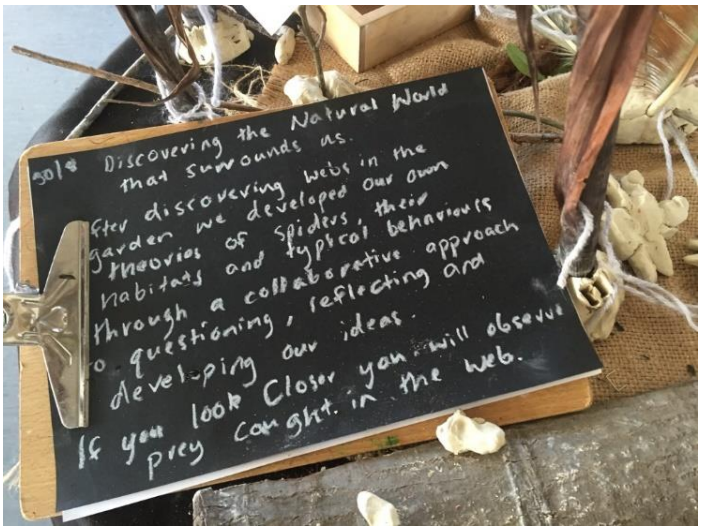


Figure 6b.14: A clipboard with an educator's description of activities involving children, "Discovering the Natural World that surrounds us" (2016).

In 2016, a self-review on place-based educational approach was undertaken at the suggestion of the ESM. Place-based education grounds children's learning within the local environment, culture and resources. For the centre, this led to replacement of sizeable static play equipment with non-static equipment children could manipulate to support their increasing responsibility around learning through play within the outdoor environment of the centre.

> Place-based education which is something quite new for here we're sort of in the very beginning of it we had a huge Fort what you and I talked about so we've taken that down so that we can open up the area and engage the children and help them take more responsibility for their learning with having non-static equipment out there. (Teacher interview, 2016)

The place-based educational approach supported connection and learning about the local environment, how the land was used, the natural resources and Māori history. Teachers researched the history of the local area, and one particular example was understanding how *Te Kōuka* [the cabbage tree], was of great importance to Māori. Natural resources were an important element of the displays in the LL, and the centre did not use red in displays. Cath said the colour red was known to activate the stress response, and therefore her preference was for choosing to use green for all background instead because "green is healing but also we thought it's a natural colour it's all in our outdoor area, and it's a lovely colour" (Cath, 2016). The reference Cath makes to "bring them down", refers to heightened emotional states and nature to support self-regulation and engagement.

> So we've been able to talk about how that land was used so we're wanting to incorporate that. And what's happening here, having the natural resources, which is what we all love anyway. Because we also know that nature does what helps get children engaged, plus it also brings them down, because once again that's emotional intelligence, self-regulation is really important to create to support children because they haven't got the skill to be able to master that yet. (Cath, 2016)

The centre was situated next to the large playground fields of the adjoining primary school, which was situated next to a large garden reserve. The location of the centre enabled easy access close green space with the children. Each week the centre group would regularly walk together outdoors with the support of caregivers to increase student to child ratios. Figure 6b.15 shows the whiteboard noticeboard at the main entrance to the centre with a handwritten weekly timetable that includes Physical Friday (2016).

> Part of that is our physical Friday, which we just did today which is every Friday but we can't do it unless we have parents coming for the ratios to go for the walk. We're just starting to have a parent who is quite happy to come and twice a week, because she wants to do childcare training. So, just her feeling enthusiastic about that is great, so it's just slowly, slowly. (Cath, 2016)

Figure 6b.15: Whiteboard noticeboard at the main entrance to the centre with a handwritten weekly timetable that includes Physical Friday (2016).

Overall, the predominant feature of the LL in this centre was the incorporation of natural elements and a conscious effort by educators to reduce the level of stimulation in response to research Cath had read showing that high visual stimulation, including visual chaos, can heighten emotional states.

> We have quite low visual stimuli because we know that if it's too busy, that heightens the children's [emotional states]. (Cath, 2016)

The low level of stimulation was observable across the LL of the centre, this included the choice of colours that reflected nature and the use of natural materials instead of plastic. Cath said they also preferred natural lighting rather than artificial along with increasing the time children spent outdoors. This low-level stimuli in the physical environment of the centre heightened Cath's awareness of the level of visual stimulation in other learning environments. When accompanying children on their transition visits to primary schools, Cath reacted to the stimulation in that it concerned her how a stimulating environment affected children.

> I always feel so sad. You enter classes and it was just so busy on the walls and it's just like wow! And if it makes me feel like that what's that doing to the children? The last kindergarten I was at had red walls and I was fighting, fighting, fighting [biting my tongue]. You do not have red. It's been proven it actually ups your stress and anxiety levels. All these things in your environment is so important as to how to set up. I think until people have that knowledge we can't act upon it. (Cath, 2016)

I was inclined to agree with Cath, as I have the same sensitivities to an overstimulating environment. The natural lighting, the natural materials, the reduced number of colours and open doors creating a well-ventilated space gave me a sense of ease. Such a consideration aligns with Bronfenbrenner's consideration of chaos as a disruptor of proximal processes. Nature seemed to create neutral space; one that perhaps communicated to my subconscious a sense of affinity or belonging. It was a space that was inviting not only in the LL, but also in the aesthetic, the layout of the furniture, the open door, the outdoor noticeboards, and the *whānau* [family] corner with two couches provided for adult seating; inviting adults to take a seat, spend some time and share a book.

6b.2.2 Home Environment Proximal Processes in 2016

I met Jade a couple of days later and we sat down on the couches in the whānau corner next to the display of library books and a box containing children's profile books. It seemed she was a regular visitor as children started approaching her asking her if she was able to read them a book. She had her youngest child with her. It was the beginning of the morning session in the centre, things were busy around us and the session was about to begin. We chatted for a while as we observed the activity around us. Jade's eldest child Manawa, was an emergent bilingual Māori child attending the centre in 2016 and was 4-years-old. Both Jade and her husband spoke English and Jade incorporated some Māori words into her everyday interactions with her child. The home environment had limited DT devices, the television and Jade's iPhone that Manawa interacted with occasionally. Interactions with DT were in English only.

For many New Zealand Europeans growing up in New Zealand, Māori language was incorporated into their educational experience. As outlined in the New Zealand Curriculum (Ministry of Education, 2015) Māori is an official language and can be taught as a first or additional language, depending on what the school chooses to offer. Exposure to Māori language, therefore, can vary across educational settings dependent on the identities and attitudes of the individual educator and the microsystem policies of the mainstream educational setting (Barr & Seal, 2018). Jade's personal experience of learning Māori was described as "a wee bit" indicating only a little exposure within the New Zealand education system. After secondary education, Jade went on to tertiary studies in early childhood education, an additional source of acquisition of basic Māori language.

> I sort of did it at high school, [that's] about it and I was doing the early childhood course for a wee bit and we learnt a wee bit then too but then I fell pregnant so I didn't finish [the course]. (Jade, 2016)

Although Jade did have exposure to Māori language throughout her education, her perception was that her acquisition of language was minimal. Her minimal prior knowledge of Māori language acquired through her educational experiences enabled her to incorporate basic Māori words into her everyday interactions with her children. Exposure to Māori language and culture within the extended family context did not occur in the home environment. In the interview, Jade detailed some of the challenges her husband, who identified as Māori, faced during his upbringing. Due to a range of adverse childhood events, Jade suggested that her partner had become disconnected from his family members and subsequently Māori language and culture. Since having their children, Jade said that she had observed that, with her encouragement, her partner was more motivated to rediscover those connections as a way to reconnect with language and culture for his children.

> Not really because he was in care for a wee bit and stuff he did know it quite a bit but when he went away for a bit he lost… he stopped talking about it. He wants to find out because I told him it would be cool to find out for the kids as well. (Jade, 2016)

Jade's description of Māori language and culture as "cool" for her children suggests she held the belief that Māori language was a valuable resource for her children. Jade said that Māori language acquisition was important for her child as it was a part of Manawa's identity and wellbeing.

> Because it is a part of him [Manawa], as well it's good for him to learn it. (Jade, 2016)

Support from additional external environments and language communities provided networks to enable Jade to support the bilingual and bicultural identities of her children. However, the evidence here is likely to be incomplete; further questions around other cultural connections Jade may have had beyond the ECE centre and family may have revealed other external support networks were available to her, in addition to the local community initiative mentioned by Cath in 2017.

Proximal Processes within the home environment

The proximal process within the home environment microsystem involved interactions in English with some Māori words and with a variety of family and community members. The shifting power, direction, content and form of those interactions varied as indicated in the following descriptions.

Presence and use of minority languages

Given the limitations on gathering LL data from within the home, (such as the interview was undertaken in the ECE centre); Jade was asked if there was any Māori language visible on the walls within the home environment. From her recollection of her home environment and interpretation of the definition, she said the LL of the home environment had no language or cultural decoration visible on the walls.

> No, not really. I don't think we have anything Māori in our home but it would be good to get them though actually. (Jade, 2016)

Jade received the suggestion of making Māori language visible within the home as a good idea, although she made no further comment on what she considered the advantages of Māori language and culture being visible within the home environment. Further questioning about the advantages of a rich LL and if any other languages were visible in the home would have given a clearer understanding of the LL of the home but I felt it was better to not press for more information on her home environment so early in the interview. English was the primary language spoken at home with the occasional incorporation of Māori terms. Māori language use with her children within the home environment was based on Jade's own Māori vocabulary knowledge. It was unclear if the Māori words used within the home environment were in addition to the Māori language loanwords already incorporated into everyday New Zealand English.

> I'm just New Zealand, but their Dad is Māori, so he doesn't really know much. But whatever I know I try with [my child]. We just mainly speak English we have been trying to do some Māori words. (Jade, 2016)

Interacting with digital technology and the virtual linguistic landscape

The digital technology in the home environment could be considered another source for increasing the presence and use of language in the home environment and an ever-changing aspect of the LL. The home environment had one television, and Jade had an iPhone. The home did not have an internet connection, and the iPhone was predominantly used for texting, calling and occasionally Facebook. The iPhone had data, but also, given the proximity to the neighbour, she could connect to the neighbour's Wi-Fi with permission. She also occasionally accessed free Wi-Fi available in public spaces when they were outside of the home environment.

> Well, I don't really go out much just if I'm at the bus stop and there's free Wi-Fi there. (Jade, 2016)

Manawa watched children's television programmes before and after school. Jade was unsure if any of the programmes included languages other than English. The children's television viewing did not include watching the Māori television channels or programmes.

> [My child] just really watches the kids' programmes after school and early morning sometimes. (Jade, 2016)

Children's programmes with Māori language were available on Māori television channels. Jade had watched Māori television in the past, but she said she was not sure if watching children's programmes in Māori would be of interest to her children. The access to Māori programmes could provide exposure to Māori language within the home environment without additional expense. Although Manawa did not have independent access to DT at home, he could use DT in other external environments such as the neighbour's home and within the ECE centre. From what Jade's said she understood, the educator's use of the iPad in the centre was limited to playing music only and children's use was minimal.

> I don't think they do [use the iPad]. I don't know. Yeah, the teachers have an iPad they use, but the kids don't use it they just put music on for the children. (Jade, 2016)

Manawa did occasionally have access to Jade's iPhone. Content on the phone was limited to age-appropriate "learning" games specifically chosen for her child. Jade said her child did not often use the DT and preferred to either read books or build things. Occasionally, when they were out of the house and had time to fill, he would use DT as a way of passing the time.

> I don't know really because he [Manawa] doesn't really play on my phone or anything like that. I've got a couple of games on there for him, but he hardly plays them just if we go to appointments and there and we have to wait ages he plays them he doesn't really play on them. (Jade, 2016)

An additional environment for the children to access DT was at the neighbour's home. Manawa had access to a tablet, but Jade considered his use in the neighbour's home environment as minimal and occasional.

> He'll play on the neighbour's iPad or tablet for 5 minutes if we go there, but apart from that, he's hardly on anything. (Jade, 2016)

Manawa was free to visit the neighbours whenever he wished, which Jade said was daily. Time at the neighbours was predominantly to play, sometimes with his bike, and to talk and socially interact. Although it was not asked what languages were spoken within the neighbour's home, it was presumed that the neighbours spoke English only within their home.

> He doesn't [always] play on the iPad though he just goes there and visits and talks away. (Jade, 2016)

Jade's children were connected to a community that provided multiple opportunities for Manawa to engage in social interaction, as he was free to move between environments of the home and the neighbour's house as well as being in close proximity to the ECE centre. Jade stated that Manawa preferred active engagement with people, books and building as opposed to engaging with DT. She described his use of DT as "hardly on anything" (Jade, 2016). Her child's preference for reading books and building things aligned with the behaviours supported by the ECE centre's emphasis on play, nature and minimal use of DTs. Her child displayed a clear interest in literacy and displayed curiosity about the significance of written words. Storybook reading enabled Jade to support her child's language development as well as his literacy awareness. Jade indicated that her child had some oral language development delays; she said, "he can't speak properly" (Jade, 2016) and that his pronunciation of words needed support. She aimed to engage in any activity that would prompt him to speak more frequently and utilised books during reading as prompts for pronunciation practice.

> I've been trying to get him to say words that he can't pronounce properly trying to get him to say them when I read to him. I try and get him to say some words too because he's always like "What does this say?" (Jade, 2016)

This shared reading was an activity that Jade engaged in across settings as Jade said she often spent time in the centre reading stories to children, with many books given to Jade and her family by the ECE centre.

6b.3 Mesosystem – Caregiver and Educator Proximal Processes in 2016

The educational setting and home environment of the emergent bilingual child have been described in detail to appreciate some of the proximal processes that support the presence and use of minority languages in each setting. The proximal processes were defined as interactions with people, objects and symbols, this included DT as an object within the environment and the languages as the symbols visible in the LLs of the educational setting, both physical and virtual. Engaging caregivers and developing relationships were valued as fundamental to the processes supporting the language development of minority languages. All teachers interviewed at the centre expressed the importance of strengthening the connections between the ECE centre and the home environment for children's development. This strength of connection was evident in Jade reported interaction with the centre and indicated that she spent a lot of time in the centre as she lived close and it was easy for her to visit.

Proximal Processes within the Mesosystem

The proximal processes identified from interviews and observational data illustrate the interactions between the caregiver and educators of the emergent bilingual Māori young child and associated microsystems. The ECE centre was a strong support for the home environment, particularly for supporting the Māori language presence and use within the home environment.

Presence and Use of Minority Languages

The primary purpose of the LL was to engage with caregivers in order to communicate the centre programme, values and children's learning. Cath said, "The linguistic landscape is meaningful and at a level that parents will understand what the centre is trying to communicate." (Cath, 2016). The main forms of communication to caregivers were via the noticeboards within the physical space, a noticeboard outside at the end of the pathway (Figure 6b.7), a whiteboard at the covered entrance (Figure 6b.8), the programme planning display (Figure 6b.16) and the dashboard on the e-portfolio system, Educa (Figure 6b.19). Cath said she believed it was "important to keep it changing, otherwise, parents don't look" (Cath, 2016). She updated the whiteboard in the morning and afternoon and included photos of the children's activities from the day. Cath reported that she had found that these displays and notices, particularly if kept updated, could initiate and mediate conversations between educators and caregivers.

> I put that up so it's a whole mix of things but it's also trying to let the parents know what is happening and having them engage in the programme and maybe creating conversations. (Cath, 2016)

Like my own experience of entering the centre environment, my first encounter with the LL was the outdoor noticeboard (Figure 6b.7). The outdoor location of the noticeboard was visible from the main gate entrance before entering the centre building. The outdoor noticeboard was initially developed for what Cath described as a "community report", notices for the centre community with content that demonstrated cultural concepts.

> Outside, we've started a community report [noticeboard] each term last term. I mean last term I put photos up that celebrated, but also were examples of*, tikanga* [culture], *kotahitanga* [unity], *mannakittanga* [hospitality], *whanaungatanga* [kinship]. (Cath, 2016)

All teachers at the centre said they were working on relationships and trying to get caregivers to participate in the programme as much as possible. This was observed in the LL with the Programme Planning display (Figure 6b.16) in the whānau area, which included a laminated page and whiteboard pen for caregivers to write ideas for programme planning. Figure 6b.16 shows the programme planning display inside the centre with a laminated sheet for caregivers to write their Parent/Whānau Voice and Ideas (2016). The ideas included ring tossing, bubbles, hopscotch, composting, a worm farm, respecting books, a disco and more, all written in English. This display empowered caregivers to have a voice within the LL and the programme planning. This display mediated bidirectional mesosystem proximal processes that gave power to the whānau voice in written form, in addition to what looks like children's contributions (scribbles).

Figure 6b.16: Programme Planning display inside the centre with a laminated sheet for caregivers to write their Parent/Whānau Voice and Ideas (2016).

Caregivers would often sit with children on the mat at the beginning of the morning session, referred to by the teachers as whānau time, as some needed an adult with them for supporting them in engaging in mat time. Minority languages and culture were incorporated into the whānau time sessions, and during my interview with Jade the singing and storytelling including minority languages was taking place in the background. Jade engaged in many of the centre's activities, and she could observe that Manawa was learning and developing along with improved social-emotional wellbeing compared to previous centres he had attended.

> It's good because we've been involved with quite a few things with the centre and it's good [my child] has been learning heaps he has been more happier here than any other one, so it's good. (Jade, 2016)

Figure 6b.17: Signs for caregivers displayed at the entrance of the centre asking for caregiver contributions, fruit donations and taking home laundry to wash (2016).

Evidence of the centre inviting caregiver participation were observed in the LL. Figure 6b.17 shows signs for caregivers displayed at the entrance of the centre asking for caregiver contributions, fruit donations and taking home laundry to wash (2016). As mentioned, the intention of the LL was primarily to connect and communicate directly with caregivers, so the development of displays took time to ensure that the environment was welcoming for multicultural families and was considered an ongoing process that appeared to be responsive to the dynamic nature of diversity amongst children and families within the centre.

> We're working really hard on trying to create or make an environment that is welcoming to our multicultural families so that's a work in progress. (Cath, 2016)

The centre sustained ongoing work on developing a welcoming and inclusive environment for both children and families. Caregiver engagement and relationship building was a high priority and an integral aspect of their centre's philosophy for supporting the learning outcomes of their children.

> We're working really hard on getting parents through the door as part of our philosophy is having parents engaged in what is happening because without them being on board we're not going to be able to create the learning outcomes for the children. (Cath, 2016)

All teachers interviewed from the centre referred to the importance of developing more in-depth and authentic relationships with families. Many displays valued the identities of children, some constructed with the collaboration of families to ensure the displays were authentic and not tokenistic. Although this collaborative engagement was a slow process, it enabled each display to have deeper meaning and value.

> We are trying to that's all part of getting the *whanaungatanga* [kinship] getting people engaged and showing that we value them and where they come from taking it deeper and also for us just to learn about it too. (Cath 2016)

Jade reinforced the concept of creating a sense of *whanaungatanga* [close connection between people, kinship] as she said she felt like the centre was an extended family. She felt free to visit the centre throughout the day and often she stayed in the centre each morning until her youngest child was ready to sleep. Due to the proximity of the home to the centre, it was convenient for Jade to visit and engage with the programme in the centre.

> We stay here for mat time every morning normally he'll go to sleep about 9:30 so we'll go home and if we're not up to much we'll come back and just chill out. We'll sometimes have morning tea or lunch with the kids. (Jade, 2016)

The ECE centre had a large selection of picture books displayed in a library bookshelf in the whānau corner with noticeboards and additional information for caregivers and families. The centre was purchasing resources, such as books in different languages, to reflect the different cultures and languages of children attending the centre.

> It's buying resources as well. These are the Fijian ones, which are like matching games. [We are] trying to have our resources reflecting the different cultures as well as language. (Cath, 2016)

Jade said she thought her child used more Māori vocabulary than she used and had observed her child using Māori words across the home and educational settings.

> [My child] uses [Māori] more than me actually, because he knows about it. He's tried counting in it so that's good. I've just been reading his profile book and they have just started teaching [the children] Māori words, some other languages well. I think it was Tongan. (Jade, 2016)

Jade attributed her son's acquisition of Māori language to the educator's explicit teaching and integration of Māori language into the programme in the centre. She also observed Māori written in his learning stories in his physical profile book. The incorporation of a number of minority languages and images within the physical profile book was often in collaboration with caregivers, by asking families what was relevant, researching online and then consulting with the family to check accuracy and appropriateness. Tania's positioning of the caregivers as the "experts" of culture and language reinforced the need for the educators in the centre to develop safe relationships to enable caregivers to collaborate and contribute to the language environment of the ECE centre. Language practices in the ECE environment were continuing to support linguistically diverse children through *waiata* [song], counting, greetings, and incorporating language and cultural images in children's learning stories.

> Using songs, *waiata* [songs], is probably a really good way we learn songs and Tongan here we ask the parents to bring it in and teach it with us if they feel comfortable. If they don't feel comfortable we try to find other ways, but they are experts definitely and in terms of the Māori side of it, definitely having those links to that *Tangata Whenua* [people of the land]. They are the experts so that's some things we do. (Tania interview, 2016)

Thus, the integration of minority languages in the centre was through collaboration with caregivers, and the safe relationships developed with educators. In this relationship, the educator positioned the caregivers as experts, strengthening their power within the mesosystem proximal processes to influence the daily presence and use of minority languages within the programme.

Interacting with digital technology and the virtual linguistic landscape

The centre used the Educa digital platform that enabled educators to share children's learning experiences with the home, whilst linking their learning to the curriculum. Figure 6b.18 illustrates a screenshot of the Educa homepage taken in 2016. The Educa online e-portfolio software allowed caregivers access photos, videos and learning stories, and to share and contribute to the portfolio with family both locally and globally. Teachers used greetings in other languages and created opportunity for caregivers and extended family to contribute in minority languages. The use of the physical profile books remained in the centre in conjunction with Educa. Therefore, one was not at the exclusion of the other. The e-portfolio allowed caregivers to comment, and download content in a way that maintained privacy for users. The Educa platform mediated bidirectional proximal processes in virtual form; with minority language content that enabled caregivers the power to respond to children's learning and share with extended family.

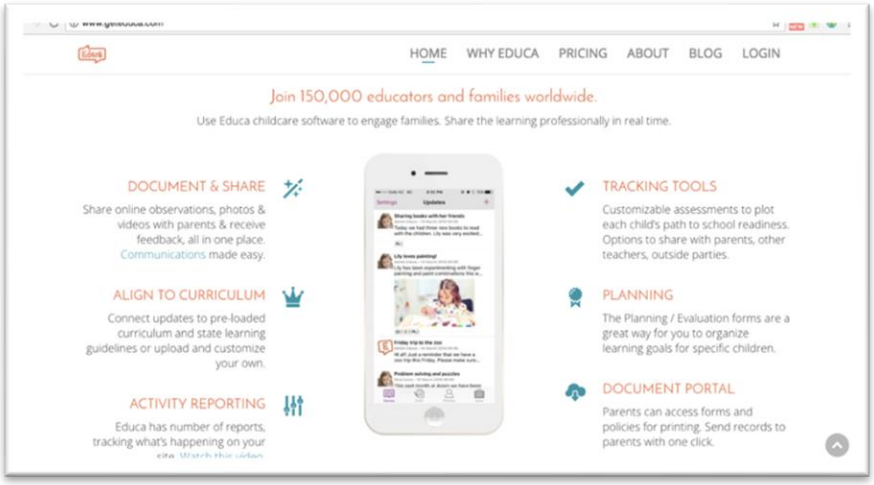


Figure 6b.18: Screenshot of the Educa homepage taken in 2016.

In 2016, caregivers had not engaged in the dashboard, as the centre was yet to offer education to caregivers on using Educa. The e-portfolio in this study was not directly observed and it was not clear if engagement had increased or caregiver education was offered in 2017. Similar to the physical noticeboard and whiteboard, Cath recognised that for the Educa dashboard to be successful, it meant keeping it updated regularly. There were time limitations on this as dashboard updates were done outside of the teachers working hours.

> A lot of stuff I'm putting on the dashboard I am doing at home. I don't have time here. I think part of the problem is, particularly with me being the head teacher; I'm on contact time the whole time. Even when the equity teacher [is present] still best for me to be out on the floor because it is for an improved ratio so that we can actually have better learning outcomes will the children. (Cath, 2016)

Children's learning stories in their physical profile books and on Educa had minority languages interwoven occasionally. Cath collected cultural icons and images on her computer available to use. Limitations on incorporating minority languages in learning stories were on the amount of time this took, as there are many websites offering information. Cath said she thought there were few families at the centre who did not have technology at home; therefore, it would be possible for all families to access Educa. If they did not have access, Cath encouraged the families to use the free internet at the public libraries. When asked if the families attending the centre were able to interact via digital technology, Cath replied,

> Yes, definitely with our online profile system. There are only a very few who do not have Internet, not many. The other issue is if they did have internet they might be limited but we always just explained that the library has got free Internet, because everything does seem to be more online now and our profile system, I think is a great way of making connections

> with extended whānau as well. So, I really like that as well, that's definitely something that we are trying to get all the parents on board with. And they can comment on it, they can download from it, it's private so it's a really good system. (Cath, 2016)

Equity in accessibility presents as a potential disruptor of mesosystem proximal processes mediated by the VLL of the educational setting, however community networks were available, such as Jade being able to access her local library Wi-Fi but Jade also faced barriers in accessing this due to limited transportation.

6b.4 Time – The Linguistic Landscape of the Educational Setting after One Year

Approximately 12 months later, I returned to the centre to undertake a second LL and interview Cath. Figure 6b.19 gives an overview of photographic evidence, as categorised by language visible, in the LL of the centre 2016 (n=30) and 2017 (n=38). Over the twelve months, I had engaged with Cath in a number of ways, including undertaking a workshop within the centre on their LL with the centre team, Study three members and a representative from the Ministry of Education. Our relationship had developed since 2016 and communication with Cath was always responsive.

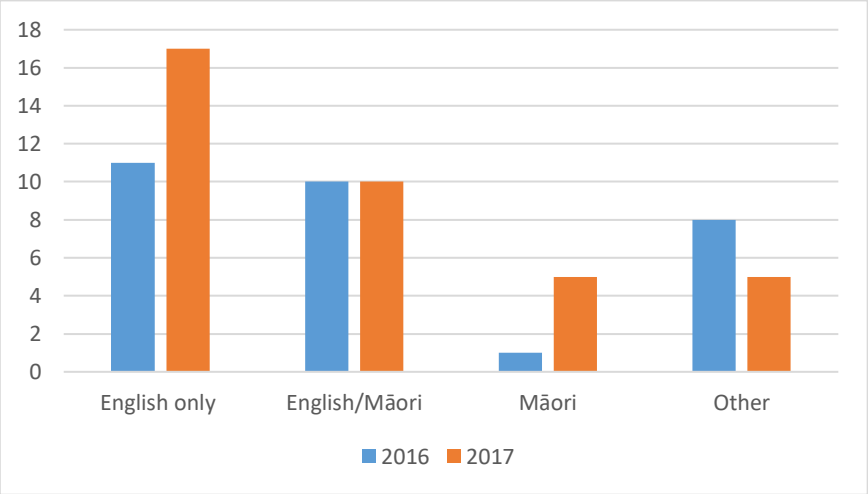


Figure 6b.19: An overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the centre 2016 (n=30) and 2017 (n=38).

In 2017, I took 72 photos of all the wall displays in the centre, or a representative part of a display. Of the 38 photos that contained linguistic items (Figure 6b.19), 20 included some level of Māori. The number of photos with Māori only or mostly Māori within the LL had increased over the year, from two photos in 2016 to 11 photos in 2017. This increase in the presence of Māori language reflected the commitment to Māori language development that the teachers expressed in their interviews in 2016.

Figure 6b.20: Multilingual greetings display Our *Whānau* [family] displayed opposite the main entrance to the centre and displayed at child height (2017). Display includes nine languages with associated cultural images and strings connecting the image and greeting to the country on a map.

The multilingual greeting display observed in 2016 (Figure 6b.11), had developed in 2017 to be a more significant display in the centre. Figure 6b.20 shows the multilingual greetings display Our *Whānau* [family] positioned opposite the main entrance to the centre and at child height (2017). Display includes nine languages with associated cultural images and strings connecting the image and greeting to the country on a map. This display was positioned at child height and opposite the main entrance to the centre, so that it was one of the first displays to see on entering. Beside this display was an attendance board, with a magnet board surrounded with children's names and profiles for children to identify their name and place it on the magnet board when they arrived at the centre. The intention of the display aligned with Cath's interview in 2016, in which the development of the LL was based on engaging caregivers with children's learning and the value of *whanaungatanga* [kinship].

The concept of family was observed in a number of ways in the centre programme and LL, with the morning "whānau time" and the "whānau corner" set out in the environment that gave family a comfortable place to sit and share storybooks and physical profile books from the library. In 2017, the Programme Planning wall in the whānau corner, behind one of the two-seater couches, had evolved to display large photos of children engaging in activities with less writing compared to the 2016 programme planning wall display. Figure 6b.24 shows the programme planning *Whakatakako Tātaro* display in 2017 featuring larger photos of children (faces obscured) engaging in activities. Some labels featured Māori language. The Whānau Voice element of the display, Figure 6b.16 with a laminated

sheet for caregivers to write their Parent/Whānau Voice and Ideas observed in in 2016**,** was not observed in 2017.

*Figure 6b.24: Th*e Programme Planning *Whakatakako Tātaro* display in 2017 featuring larger photos of children (faces obscured) engaging in activities. Some labels featured Māori language.

The use of Māori language in the LL had increased since 2016, and the use of Māori in the LL had developed in complexity to include more *kupu* [words], sentences and *waitata* [songs] that appeared to indicate more frequent and integrated use of Māori within the centre. Figure 6b.21 shows examples of *waiata* [song] lyrics in Māori and a poster labelling parts of the body with handwritten Māori translations in the mat area of the centre used to support teachers during singing (2017).

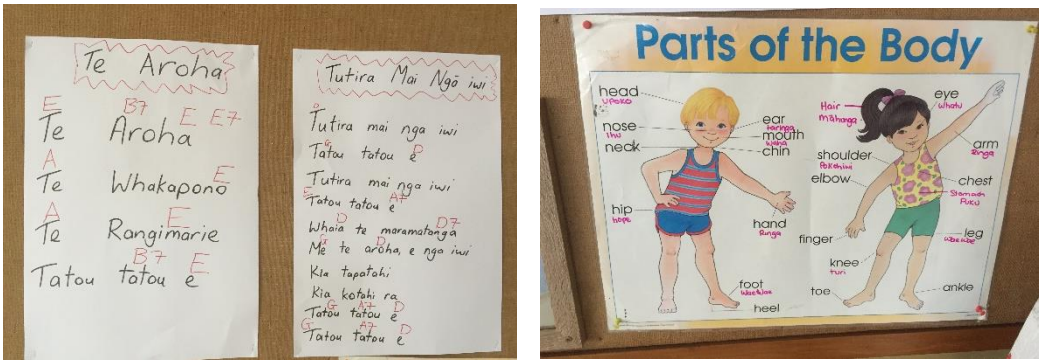


Figure 6b.21: Waiata [song] lyrics in Māori and a poster labelling parts of the body with handwritten Māori translations in the mat area of the centre used to support teachers during singing (2017).

Other prompts in the LL were also observed, such as positive phrases in Māori, with the English translation in a smaller font underneath, on the windows next to the mat area. Figure 6b.22 shows the positive phrases in Māori displayed on the window and walls of the centre with Māori in large letters with the English translation below. Signs were decorated with Māori design (2017). The positive phrases had increased in linguistic complexity from the word labels observed in 2016. These positive phrases and the positioning at adult height on the window suggested the intention was to support the adult's integration of Māori language in the daily proximal processes between adults and children. Cath reported that whānau time was an opportunity for ECE teachers to model skills and strategies to caregivers that were likely help with children's emotional regulation, thus, this would include the modelling of Māori language use with children.

> There is a little bit of parent education that goes on while whānau time is happening as well. So, practical engagement with lots of positive reinforcement from the ECE. (Cath, 2017)

Figure 6b.22: Positive phrases in Māori displayed on the window and walls of the centre with Māori in large letters with the English translation below. Signs were decorated with Māori design (2017).

The increased complexity of language use also extended to the use of minority languages in the physical profile books, which were also published via Educa and shared via the caregiver's personal login accounts accessing children's e-portfolios. Although it was not observed within the physical profile book or e-portfolio, in 2017 Cath said each portfolio book included, "something relevant to their whānau or their *whakapapa* [genealogy]" along with multilingual greetings and *whakatauki* [Māori proverb]. The physical profile books were positioned in the whānau corner. The physical profile books were together in a box and accessible to children and their caregivers and positioned next to the library books to indicate that it was available to read. In 2017, the profile book covers included a greeting associated to their ethnic identity, a Māori greeting, a whakatauki and their profile photo framed with Māori inspired design. Figure 6b.25 shows children's physical portfolio books accessible to children and adults to read in the seating area of the centre (2017). The profile books include a welcome and proverb in Māori along with the child's name and profile photo (faces obscured). The

portfolio on the right includes a Fijian welcome with a Māori welcome on the cover of the book. The Fijian welcome matches the Fijian identity and culture of the child and their family (2017).

Figure 6b.25: Children's physical portfolio books accessible to children and adults to read in the seating area of the centre (2017).

In 2017, the centre continued to maintain the physical profile book in conjunction with Educa, the e-portfolio system. Cath said children had occasional use with the iPads, but the limitations on this use was the predominant focus of the centre programme on emotional literacy, limited knowledge on iPad use of learning outcomes, and the teacher ratio in order to facilitate the use of the iPads with children.

> We sometimes bring out the iPads but not very often because I still want to work on what's the acceptable, good way of using them so that there are learning outcomes for children. Ideally, I would love them to go take photos of things but because we are working on emotional literacy as a predominant area of working here, it's not something that can happen here at the moment unless we have a better teacher ratio. (Cath, 2017)

Evidence of nature and the place-based education approach were observed in the LL, with displays of the natural world that included Māori terms and the use of natural play materials. Figure 6b.23 shows examples of incorporating nature into the internal environment with pictures of birds attached to the inside windows looking out, with labels in English and in Māori. Natural play materials, woodcuts used as play equipment in the centre (2017).

Figure 6b.23: Incorporating nature into the internal environment with pictures of birds attached to the inside windows looking out, with labels in English and in Māori. Natural play materials, woodcuts used as play equipment in the centre (2017).

The link between nature and emotional regulation was a consideration that Cath applied to her development of the LL. Many of the natural materials used were also contributing to a cultural aesthetic. When considering the incorporation of cultural elements to the LL, the establishment of safe relationships with caregivers were fundamental in order to develop a LL with the presence and use of minority languages.

> In regards to bringing the culture in, the relationships have to be there first with the parents, to feel comfortable about it. We are trying to connect people. (Cath, 2017)

For families like Jade's, the linguistic and cultural resources of their minority language were not well established, therefore using minority languages as a learner may cause adults to be uncomfortable with the presence and use of the minority language. One display in the LL of the centre in 2017 was designed by one educator to counter the emotional risks in language learning, particularly as an adult and as an educator. Figure 6b.26 shows the whiteboard noticeboard outside of the centre, next to the main entrance, with handwritten multilingual greetings and a new feature in 2017, Educator's ***Tikanga word for the week and te reo Māori phrase.*** "Ako – Where the teacher and the child are learning from each other, learning from and alongside others, recognising oneself as a learner and the reciprocal relationship between learners. *Kei te aha koe?* What are you doing today?

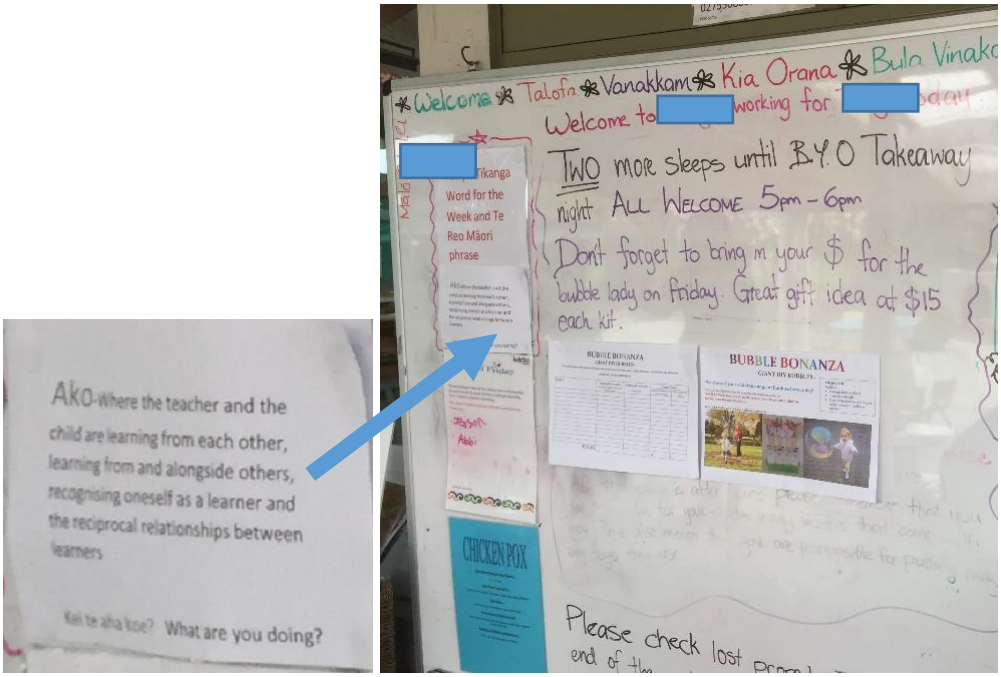


Figure 6b.26: The whiteboard noticeboard outside of the centre, next to the main entrance, with handwritten multilingual greetings and a new feature in 2017, Educator's ***Tikanga word for the week and te reo Māori phrase.*** "Ako – Where the teacher and the child are learning from each other, learning from and alongside others, recognising oneself as a learner and the reciprocal relationship between learners. *Kei te aha koe?* What are you doing today?

The educator's "Tikanga word for the week and te reo Māori phrase" displayed on the whiteboard at the covered entrance to the centre made the educator's learning journey visible whilst providing an opportunity for the caregivers to follow the educator's progress. The Tikanga word of the week and te reo Māori phrase in Figure 6b.26 is "Ako – Where the teacher and the child are learning from each other, learning from and alongside others, recognising oneself as a learner and the reciprocal relationship between learners. *Kei te aha koe?* What are you doing today? Figure 6b.26 is an example of proximal processes that aim to increase the social safety surrounding the presence and use of Māori language within the centre. This also reduced the power of the educator as the expert within the proximal processes within both the microsystem and mesosystem and positioned them alongside caregivers as learners.

Summary of Case Two

The aim of this case was to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that supported the presence and use of minority languages within the LL and how the LL of the educational setting developed after approximately one year. The LL of the mainstream primary studio was mostly in English with some Māori language presence and use and support networks predominantly focussed on English and Samoan. The presence and use of minority languages developed as observed in 2018 in the LL and VLL, with caregiver engagement a primary purpose of the LL and collaboration of displays taking time to ensure diverse content was authentically developed. This mainstream ECE centre is one of nearly 70 kindergartens belonging to one large organisation. The ECE centre serves an ethnically diverse community and has a service roll of 31 for over two-year-old children. The ECE centre had a LL rich in Māori language supported by daily language interactions consisting of *waiata* [song], *karakia* [prayer], incorporation of *kupu* [words] and *whakatauki* [proverbs]. Māori and other minority languages were visible in multiple forms such as the children's physical profile books, e-portfolios, picture books and noticeboards. Support for inclusion of linguistic and cultural artefacts was through the collaboration with *whānau* [family]. Engaging family, creating conversations and creating a welcoming space was fundamental to the development of language and cultural visibility within the centre. The value of ensuring languages was not only seen but heard within the centre and was also expressed by Tania in her interview, in order to add authenticity to their work.

Jade, the caregiver in this case, was a New Zealand born European who lived with her partner, who identified as Māori, and their two children, one attending the ECE centre (Manawa). They lived together near the centre, which enabled Jade to visit the centre at any time during the day. English was the primary language used within the home environment, and both parents were motivated to use some Māori with their children. The presence and use of languages within the centre appeared to have contributed to Jade's perception that her child's Māori language was developing and his increasing use of Māori stemmed from the centre. She was able to observe her child using Māori language across the home environment and educational settings. His development had exceeded her own perceived level of Māori. Educators in the centre developed connections with external organisations to facilitate reconnecting families with Māori culture and *whakapapa* [genealogy]. Cath recognised the value of cultural identity and connection as the foundation for Māori language acquisition when she said, "Reconnecting needs to occur before language can be supported." Cath

recognised the key role the educators in ECE had in reconnecting Māori families and the need to "embed" Māori language and culture into their practice.

Jade had an iPhone, which her eldest child only used occasionally, and television that the children watched before and after attending the ECE centre. Manawa also freely visited the neighbour and enjoyed socialising there. He also had access to DT in the neighbour's home environment. It seemed that most activities on DT were in English across the environments of the home, centre and neighbour's house. To reinforce her child's language development Jade utilised picture books as prompts for developing his pronunciation and vocabulary. The ECE centre gave her many of the picture books to keep that she used within the home environment. She reported that she read to her child daily as well as to other children within the centre during the day. It was not clear if these books were inclusive of Māori language or cultural concepts; although Cath said, the centre had purchased books that incorporated minority languages as a resource for the centre. The whānau mat time was also an opportunity to incorporate minority languages through story and song. Cath said she saw whānau time as an opportunity to model parenting skills.

The main priority of the ECE centre was to strengthen the social-emotional skills of the children, developing their understanding of emotional regulation. Place-based education was a newly adopted approach in the first year (2016) to reconnect the children to the natural environment, both in the present and the past. Much of the centre environment incorporated the use of natural materials and colours and a strategy to reduce visual stimulation. Cath said an overload of visual stimulation was thought to increase "stress and anxiety levels" (Cath, 2017). Nature was interwoven throughout the ECE environment and therefore, a notable aspect of the LL that supported the child's development. The proximal processes, framed through the LL of this case indicated the ECE centre strengthened and developed connections and re-connections for whānau and community, through language and place, over the two years in this study.

Conclusion

This was an in-depth illustrative ethnographic case study of the LL of the mainstream ECE of an emergent bilingual Māori 4-year-old child who attended in 2016. This case study was interpreted through the Bioecological Systems Framework using the Process-Person-Context-Time (PPCT) model with home, school and community networks to support language development. The microsystems in

this case were the educational setting and the home environment of the child, interconnected using DT and virtual linguistic landscape (VLL) associated with the educational setting. In this case, the microsystems of the educational setting and home environment were mutually supportive and closely connected, with proximal processes supporting the emerging Māori language development for educators, caregivers and children based on the development of social, cultural and linguistic connections for the child and family. The environment with its incorporation of nature reduced the potential for chaos as a disruptor to the proximal processes. Nature, and the outdoor environment, felt like a neutral space, enabling caregivers to engage with the LL prior to entering the educators' domain of the centre.

6c. Case Three - Samoan Immersion Early Childhood Centre (CS3)

The educational setting and home environment of an emergent bilingual Samoan 4 to 5-year-old child

This is an in-depth illustrative ethnographic case study of the *linguistic landscape* (LL) of an emergent bilingual young child's educational setting interpreted through the Bioecological Systems Framework (Bronfenbrenner, 2005). The Bioecological Systems Framework is conceptualised using the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007) with contexts networked through direct and indirect social interactions. The microsystems in this case are the educational setting and the home environment of the emergent bilingual young child, interconnected using *digital technology* (DT) and the *virtual linguistic landscape* (VLL) associated with the educational setting. Mesosystem interactions of interest are between the child's educators and caregiver. The educational setting in this case study is a Samoan immersion early childhood education (ECE) centre (CS3) of an emergent bilingual Samoan 5-year-old child who attended in 2016 and had recently transitioned to primary school. This case study draws on ethnographic observations of the LL (physical and virtual) of the educational setting, interviews with educators and caregivers, review of associated documents, and the researcher's journal. The aim of this case is to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that support the presence and use of minority languages within the LLs of emergent bilingual young children, and the development of the LL of the educational setting after approximately one year.

Introduction

The ECE centre was at the end of a long driveway with no indications from the street that it was in fact an ECE centre, or that it was a Samoan immersion centre. It made me think that those families attending the centre had alternative connections with the ECE centre or had intentionally sought out the centre for their children. I had met with the centre managers prior to arranging the interview, at a local church and with the support of Ministry of Education representatives and members of Study Three, including the Samoan cultural advisor for the project. Our meeting that day was positive and the centre manager enthusiastic about participating in the research and developing a relationship with the project. I walked up the long driveway, still without signs of it being an ECE centre, until I

encountered the child safety gates and a “Yes, we are open” sign on the door. Walking into the centre I could hear the indistinguishable chatter of young children, I signed in at the foyer and then entered the main teaching area. An adult immediately greeted me with “Talofa”, a signal that I had entered a Samoan world. I was pleased to be greeted in Samoan as it positioned me within the linguistic context of the centre and eliminated my need to deliberate how I would greet people as a non-Samoan speaker within the centre. I enthusiastically responded with “Talofa”. In the main teaching area there was a staff kitchen open to the room, a large low table for small chairs placed around the table, and from this room a view to the outdoor play area. I could hear Samoan language being used by the educators and children, scanning the room I could see the walls were covered with culturally and linguistically rich artefacts and decorations. The Samoan immersion centre was set in an area of the city with a higher number of Māori (+15.3%) and Pacific Peoples (+13.7%) and more one-parent families (+18%) compared to the wider city area (Census 2013), although the centre could be attended by families living outside of the area due to the unique nature of the Samoan setting.

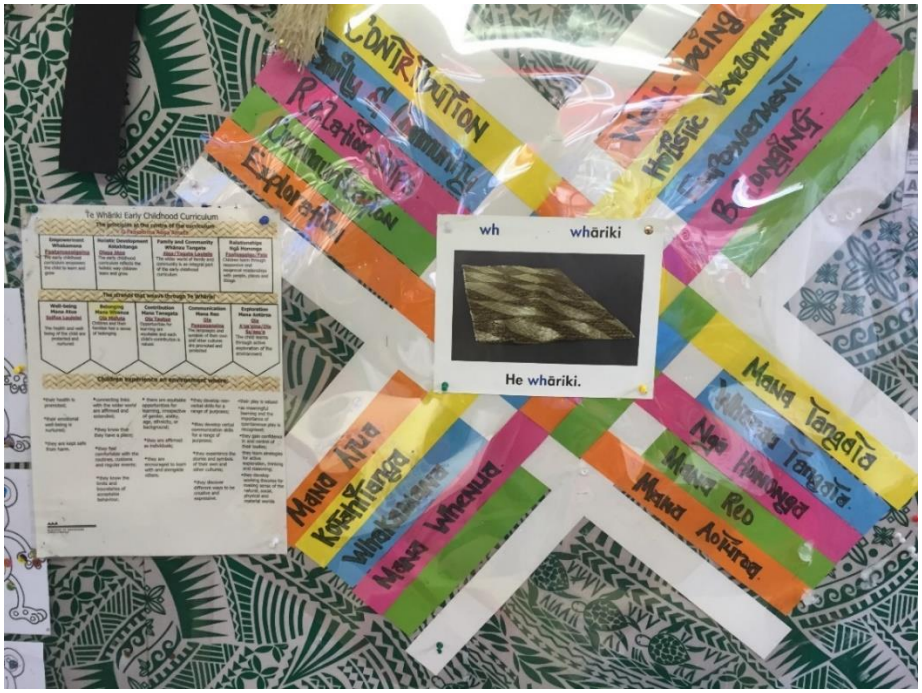


Figure 6c.1: The representation of the Te Whāriki curriculum document with curriculum principles and strands in English and Māori. The display was mounted on a cloth with Pacific design and located in a common area in the main building of the centre (2016).

At a glance, I could see the weaving of cultures and languages in the LL of the centre. Te Whāriki - He whāriki mātauranga mō ngā mokopuna o Aotearoa Early Childhood Curriculum Document balanced the incorporation of minority languages to recognise children’s diverse cultures and languages, along with responsibilities towards Māori language. Figure 6c.1 shows the representation of the Te Whāriki curriculum document with curriculum principles and strands in English and Māori. The display was

mounted on a cloth with Pacific design and located in a common area in the main building of the centre (2016).

The centre follow the Te Whāriki curriculum document (Figure 6c.1) and used the Fausiga o le Fale Tele Model. Figure 6c.2 shows the Fausiga o le Faletele: A Samoan frame identifying cultural values displayed in the community area of CS3 2016 and 2017. This display was located in a common area in the main building of the centre and is a Samoan frame for identifying cultural values, to link cultural values back to the Te Whariki document. Visual representations of these two documents were displayed on the walls within the centre and represented the consolidation of documents considered as a macrosystem influence. Fausiga o le Faletele (Figure 6c.2) was symbolised by a traditional Samoan house with a foundation, framing and roof.

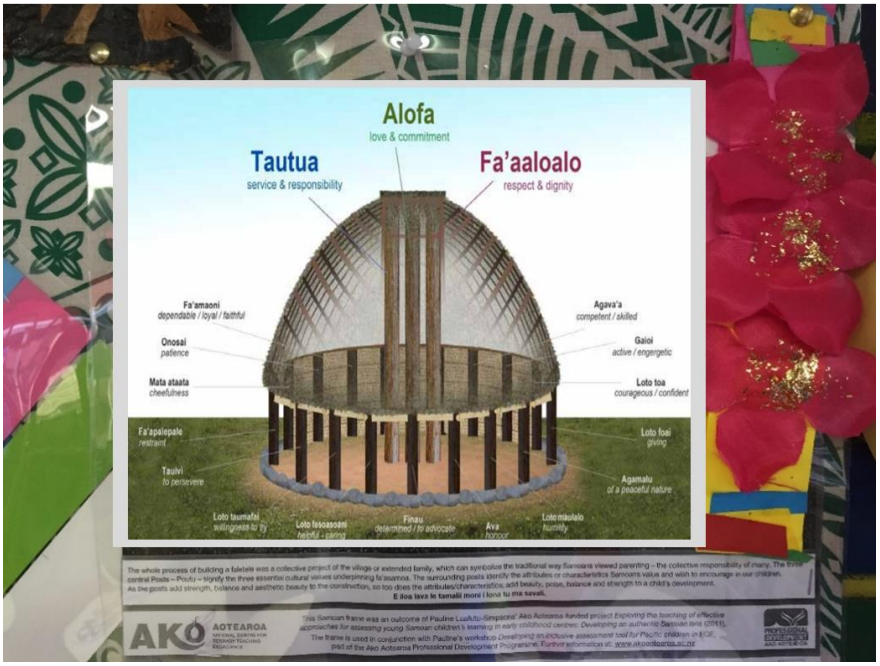


Figure 6c.2: Fausiga o le Faletele: A Samoan frame identifying cultural values displayed in the community area of CS3 2016 and 2017. This display was located in a common area in the main building of the centre.

The Fausiga o le Faletele model (Luafutu-Simpson, 2011) conceptualises Samoan cultural values for child development and collective wellbeing. The three central posts signify the essential values of *Tautua* (service and responsibility), *Alofa* (love and commitment) and *Fa'aaloalo* (respect and dignity). The three values emcompass the notion of building and maintaining good relationships and the collective responsibility of many. Gus, the centre manager, said this model made it easier to visualise the cultural values as represented in the Samoan House. Sefina, a centre educator, explained how the cultural values extended beyond the centre to be inclusive of children's families.

> Well with the Te Whāriki it's about principles like empowering and holistic development. And we've got Falatele and that is our values from our culture. So Alofa is like love. And Tautua is the contribution. Everyone's contribution, probably including the parents and families. And Fa'aaloalo is respect between each other, between the kids themselves and between them and their educators and their families and whoever else is involved. (Sefina 2016)

Weaving Samoan cultural values with the Te Whāriki curriculum principles reinforced the centre's further consolidation of documents with intentions to support the development of a sense of community associated with the centre, inclusive of families with and expectation of love, contribution and respect.

6c.1.1 People

I walked through the main learning area to meet with Gus, waiting in this office with the door open to the learning space. Gus had been recently appointed as the centre manager to oversee daily operations and he worked alongside his partner, Isla. Table 6c.1 outlines the description of educators and caregivers, their pseudonym, ethnicity and languages. The key people in this case study were **Gus** and **Isla**, as the centre managers and **Eve**, the caregiver of the emergent bilingual young child, **Anela**. Interview data from the other educators and caregiver was incorporated in the findings when it related to Gus or Isla and/or interactions with the developing child.

Table 6c.1

Description of participants in Case Three – Samoan Immersion Early Childhood Centre (Pseudonym in bold).

Participants Pseudonym	*Relationship to child*	*Ethnicity*	*Language(s)*	*Family*
Head of Centre A (**Gus**)	Centre Manager	NZ born Samoan	English and Samoan	
Head of Centre B (**Isla**)	Centre Manager	NZ European	English and some Samoan	
Educator CBA (Sefina)	Experienced educator	Samoan	Samoan and English	
Educator CBB (Leilani)	Experienced educator	Samoan	Samoan and English	
Parent CBA (Jemma)	Mother	Māori	English with some Samoan and Māori	Samoan husband and two children, eldest in the ECE
Parent CBB (**Eve**)	Mother	Samoan	Samoan and English	Samoan husband and three children, the eldest (**Anela**) recently transitioned from the Samoan ECE

Gus had arranged for me to interview two caregivers, one of which was Eve. Eve was a New Zealand born Samoan with two Samoan born Samoan-speaking parents. One of her parents was a significant and longstanding leader in the Samoan church in New Zealand. Eve lived with her partner and their three children. Her partner was Samoan/NZ European and their three children were aged 1, 3 and 5-years-old, with the two youngest attending the Samoan immersion ECC and the 5-year-old, Anela, recently transitioning from the Samoan immersion ECE to a mainstream primary school (not in this study). Eve was a trained ECE educator and at the time of the interview was working in a position related to social work. Eve spoke fluent Samoan and English. As a child, Eve was raised to speak only in Samoan within the primary family home. She never attended ECE and only began learning English when she entered mainstream primary school at the age of five. As an adult, Eve considered herself stronger in English as she occasionally encountered communicative difficulties in Samoan. At the time of the interview, Eve continued to have strong connections with the church, undertook a leadership role, and facilitated youth group activities. Eve believed that being raised in a Samoan-only speaking home benefitted her acquisition of English. She said she acquired English easily when she attended school. Her concern over the loss of language and culture for her own children motivated her to seek a Samoan immersion ECE setting for her children.

> The whole reason I put them in the school was because of the language. Because we weren't really speaking it at home. I mean, we were barely speaking it at church. We'd speak Samoan now and then and sing Samoan songs. My dad would always speak in Samoan and some English. (Eve, 2016)

6c.1.2 Networked contexts in Case Study Three

The microsystems of the caregiver and teachers in this case were networked (Figure 6a.3) with other people, contexts and systems interconnected using digital technologies, influencing the presence and use of languages across multiple contexts. Figure 6a.3 illustrates a visual representation of the networked ecological systems in this case based on Neal and Neal's (2013) Networked Model of Ecological systems. Hypothetical direct and indirect social interactions illustrate the proximal processes over time, interconnected using DT. Additional adults and associated organisations were connected to the home environment, particularly the Samoan church that networked with the home and educational setting to support Samoan language development. Contexts and associations included the Ministry of Education, Community of Learning and the Education Review Office (ERO).

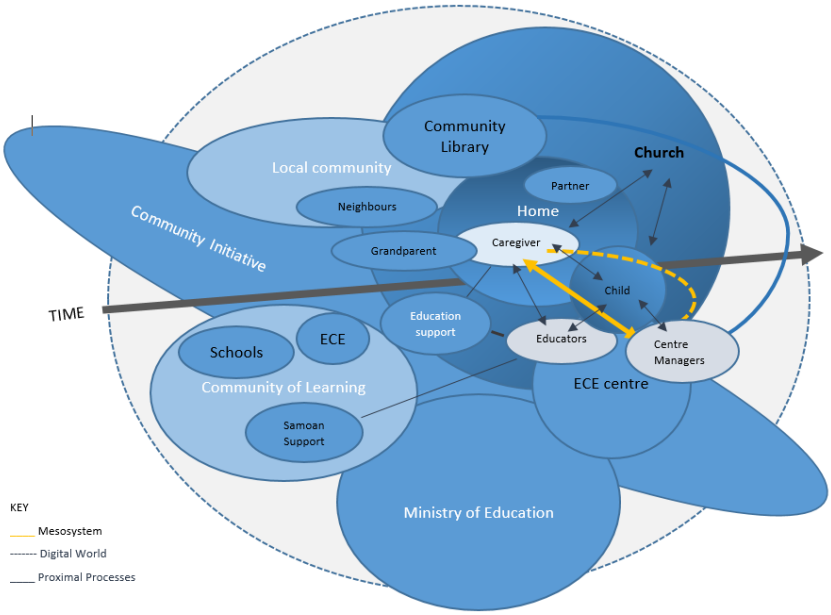


Figure 6c.3: A visual representation of the networked ecological systems in this case based on Neal and Neal's (2013) Networked Model of Ecological systems. Hypothetical direct and indirect social interactions illustrate the proximal processes over time, interconnected using DT.

Eve attributed most of her children's Samoan language development to the ECE and the Samoan church. These external environments enabled her children to demonstrate their Samoan language skills and provide opportunities for intergenerational social engagement and connection. Other adults positively reinforced Eve for her children's skills in the Samoan language, this generated feelings of pride about her children's Samoan language acquisition.

> That's where I'm grateful where I have the church, they speak a lot of Samoan; it's very bilingual. But the thing that makes me proud is that my kids, they speak Samoan and the older generation at church or my family, they always say "they're amazing," And I'm like "it wasn't me, it was the school." (Eve, 2016)

Eve had an active role in the community church. She contributed to children's Samoan language development by running a Kids' Ministry associated to the church with a translanguaging approach through which she observed successful Samoan language acquisition. "I do a lot of mixed language in Samoan and English and the kids pick it up quite fast." (Eve, 2016). Eve seemed to more easily engage with children in Samoan within the church environment compared to the home environment. The community church had a relatively even balance of English and Samoan. Eve perceived that this translanguaging approach was effective in children's quick acquisition of Samoan. It could be assumed that given the Samoan language-rich environment of the community church children may have felt freer to engage and draw upon their linguistic resources, or perhaps, it was Eve that felt more empowered in her role in the church environment and therefore the children were mirroring her

language choices in this setting. Both teachers interviewed identified the church as a valuable environment for Samoan language development. Attending the church enables children to engage with community and interact with older generations. Sefina, a centre educator, shared her regret of not continuing with church when she had her own children to support her in her use of Samoan with her own children.

> When I used to go to Samoan churches when I first came here, that's all Samoan language. It was a lot of the language, and I wished that when I did have my kids that I was still going to church, because I think they would have just picked up the language, but I didn't think like that when I wasn't a teacher. (Sefina, 2016)

Leilani, a centre educator, said that connecting to the children's experiences outside of the centre was a large proportion of their mat time conversation, which was rewarding for the children. Many of the experiences were connected to the church, such as singing which could be transferred to the educational setting.

> And the kids said, "I'm going to church!" "Who? And who?" "Me and my mom and dad and sister." "What's your sister's name?" They tell the name of the sister and their brothers. "What are you doing at the church?" "Singing!" "What singing?" I said. They said, "Singing," the child said singing ... "Can you sing ... can you tell me your song which you're singing at the church?" And kids, the children, they singing, I say, "Oh nice!" And they connect the Sunday school from here because they understand what they talking and they ... more language. Because Samoan language, they always love it. They always love it, they speak up and more language ... Because they connect from the church, from here, they can find, learn more language. (Leilani, 2016)

In this case, the church was a significant network that supported the presence and use of Samoan language both within the home environment and within the educational setting. The church environment was in addition to the networks seen in the two previous cases.

6c.1 The Linguistic Landscape in 2016

I sat in the manager's office with Gus, with the door closed I could still hear the sounds of mat time and hear Samoan, Māori and English interwoven by the educator. The children were participating and responding in the multiple languages. Gus explained that the centre was divided into three main areas, the main building with two large separated spaces for under twos and over twos, and then an external prefabricated building as a Transition room for children close to attending primary school. The mat time I was hearing was the over twos. In 2015, the service roll was 46 children, with 45 children

identifying as Samoan (ERO, 2015). The LL data and images presented in the LL section of this case were from the Transition room only. Each room at the centre was named after a bird from Samoa as a way to raise the educator's awareness of the connections between the attributes, behaviours and characteristics of the bird to classroom pedagogy, guiding documents and centre policies. There were two outdoor open-air play areas at the rear of the property. These outdoor areas had play equipment, a garden and mature trees.

At the end of the interview, Gus told me I could spend as long as I wanted capturing the LL. I started with the main building and then went outside, past the outdoor play area and to the Transition room. At the entrance to the Transition room for 3.5 to 5-year-olds, the LL began with a multilingual welcome sign and information about the room as it related to characteristics of the associated bird. Figure 6c.4 shows the multilingual greeting at the entrance to the Transition room created with children's handprints displaying information on the bird the classroom is named after (Transition room, 2016). The use of children's handprints to decorate the multilingual welcome sign communicated to me that not only were strong connections to Samoan made, but also the teachers and children were actively involved in welcoming both multilingual and multicultural practices.

Figure 6c.4: The multilingual greeting at the entrance to the Transition room created with children's handprints displaying information on the bird the classroom is named after *(*Transition room, 2016).

In 2016, I took 39 photos of all the wall displays in the Transition classroom, or a representative part of a display, to produce this LL. Figure 6c.5 gives an overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the Transition room of CS3 September 2016 (n=30).

Thirty photos contained linguistic items. Nine displays were English only and fifteen of these displays contain some level of Samoan, of which eight photos were in Samoan only. Nine displays contained some level of Māori, of which two were in Māori only. Four displays contained a mix of English, Samoan and Māori and one display with English and Samoan also contained New Zealand sign language (Figure 6c.6). It seemed the LL was similar to what I was hearing in the background during the interview.

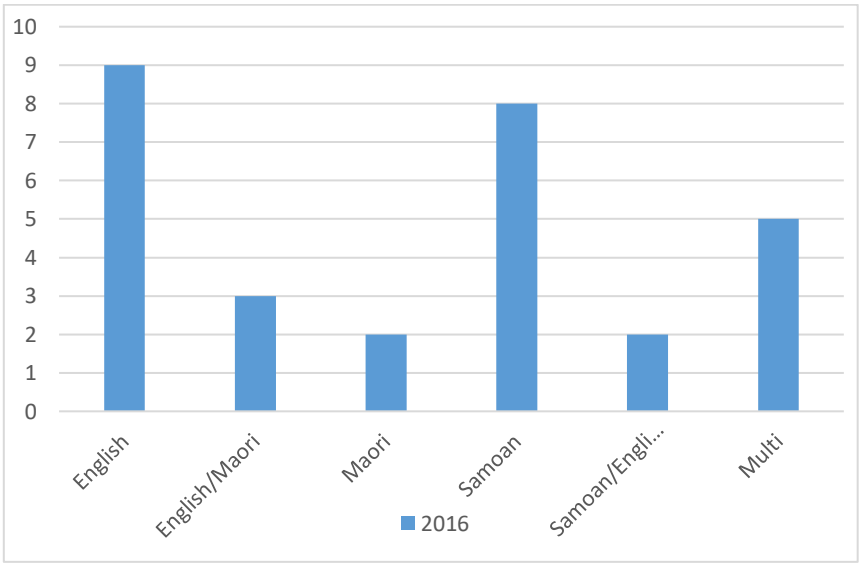


Figure 6c.5: An overview of photographic evidence, *as categorised by language visible,* in the linguistic landscape of the Transition room of CS3 September 2016 (n=30).

In 2016, the centre did not have any official Samoan language policy but staff were working to develop one. An informal practice that may inform their language policy was that a fluent Samoan speaking staff member would always be in one of the three rooms at the centre. The staff at the centre were of mixed descent with the majority identifying as Samoan. Gus said that low numbers of qualified Samoan language-speaking ECE educators was a barrier to recruiting staff that spoke Samoan. However, the priority was that the Samoan language could be supported. Therefore, staff with interests in languages was viewed as an advantage. Gus did not perceive the cultural diversity of the staff as limiting. Gus was confident that Samoan language continued to be a significant part of the programme "As long as we can have the language supported with the diverse staff" (Gus, 2016). The educators at the centre were described as having a "passion for language" (Gus, 2016) and therefore language and cultural practices were naturally interwoven and normalised into daily activities. The centre welcomed and encouraged cultural and linguistic diversity to ensure a balance of diversity.

We are trying to meet that right balance with the diversity of the staff as well. So we have got a Tongan on staff, a Sri Lankan on staff, and Māori on staff as well. That's where we are trying to get to. But you know, in an ideal world for us we would probably want to stick to as many Samoans as possible. But that's just because of the qualifications etc. Stuff like that, it's not a big deal. As long as we can have language supported with the diverse staff that we have got on board anyway, and they can pick it up. They've got a real passion for language too, so that makes a huge difference, so I'm pretty stoked with that. (Gus, 2016)

Figure 6c.6: Galuega Taulima [Craftsmanship] displayed in the Transition room, 2016.

The LL of the Samoan immersion centre created an immersion setting where all of the senses were receiving the message that this environment facilitated the presence and use of Samoan language, whilst welcoming cultural and linguistic diversity. Figure 6c.6 shows *Galuega Taulima* [Craftsmanship] displayed in the Transition room (2016) is an example of the types of artefacts decorated the centre throughout. As I left the centre, I passed the open kitchen where the educators were preparing their lunch. The educators were chatting in Samoan and laughing while working together in the kitchen. Their interactions with one another contributed to my impression of the normality, ease and fluency of Samoan language use in the centre. There was no discomfort as a non-Samoan speaker as I signalled a good-bye, this was clearly their domain, to which I was warmly welcomed and invited to join them for lunch.

6c.2.1 Educational Setting Proximal Processes in 2016

Proximal processes (Bronfenbrenner & Morris, 1998) are direct interactions with people, objects and symbols, that drive development and occur within a larger ecological system where interactions between and across systems are reciprocal and mutually influential. The proximal processes identified from interview data illustrate the interactions within the microsystem of the Samoan Immersion ECE that relate to the presence and use of minority languages. Use of minority languages was mostly Samoan, as the majority language in the centre with English and Māori as minority languages. Samoan language was heard being used by educators, between children and observed in the VLL. DT within the Samoan Immersion ECE was limited, however the centre manager had expressed the desire to increase the use of DT and perceived DT use as having multiple benefits.

Presence and Use of Minority Languages

Based on the LL, Samoan language was clearly the most extensively used language within the Samoan immersion ECE. This visibility of Samoan aligned with interview descriptions with teachers. Sefina said staff spoke mostly in Samoan and then in English to children within the centre. Māori words and phrases were also intentionally interwoven during daily routines. Figure 6c.7 shows a multilingual Prayer in English, Samoan and Māori used before eating food, used in the Transition room (2016 and 2017). Gus reported the percentage of languages used in the centre fluctuated across the day and age group areas. In the under two area of the centre, both Gus and Leilani said Samoan language was used 100% of the time. Leilani said, “It's always teaching Samoan language because the children understand what I did talk with them” (Leilani, 2016). Translanguaging within the centre increased with the incorporation of English as the children got older.

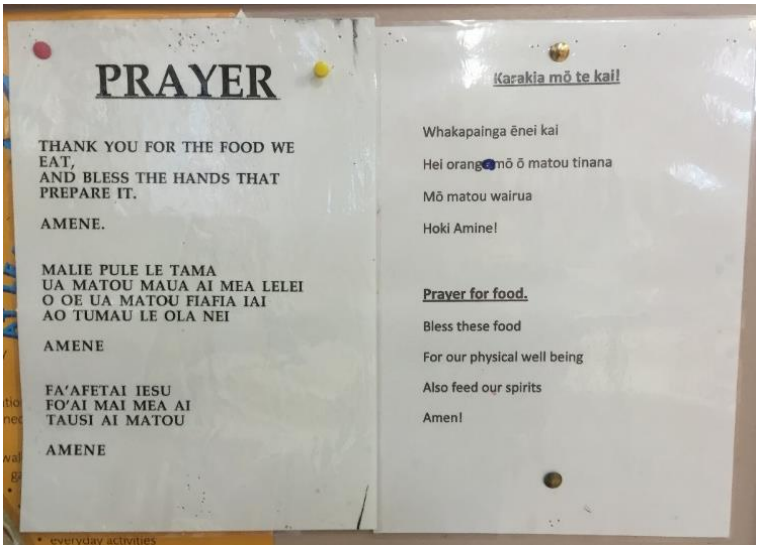


Figure 6c.7: Multilingual *Karakia* [prayer] in English, Samoan and Māori used before eating food, used in the Transition room (2016 and 2017).

Interactions with children in the Transition room involved more translanguaging and translation mediating language use with books and songs, as illustrated by Sefina when she explained her use of languages during mat time.

> We do a lot of singing and reading. We've got some part Samoan, and translate to English and some te reo Māori. So we read it to them and then ask them, "What's the Samoan word for ...?" So I'll start the word and then they finish it because that's how they learn what the word is. Yeah, giving them that start. But I think a lot of them can already speak some Samoan, and then some of them speak, the majority speak Samoan. But some of them because they have New Zealand born parents, so they hear a lot but not actually Samoan. (Sefina, 2016)

The teachers often used the stereo with CDs to play music for children to sing along to with actions. Music lyrics were observed in the Transition room that were in Māori, English and Samoan. Figure 6c.8 shows lyrics to songs reflecting Māori and English language presence and use in the centre and illustrating the centre's connections with the church practices in the Transition room (2016).

> Yeah the stereo mainly, we play action songs either in Samoan or in Te Reo Māori. Songs and we do the actions and then the other one, in English. But then there's lots of te reo Māori because the kids love to do the dance with the poi and the sticks, stick dance. And that was why we're always playing the music for them to dance to. (Sefina, 2016)

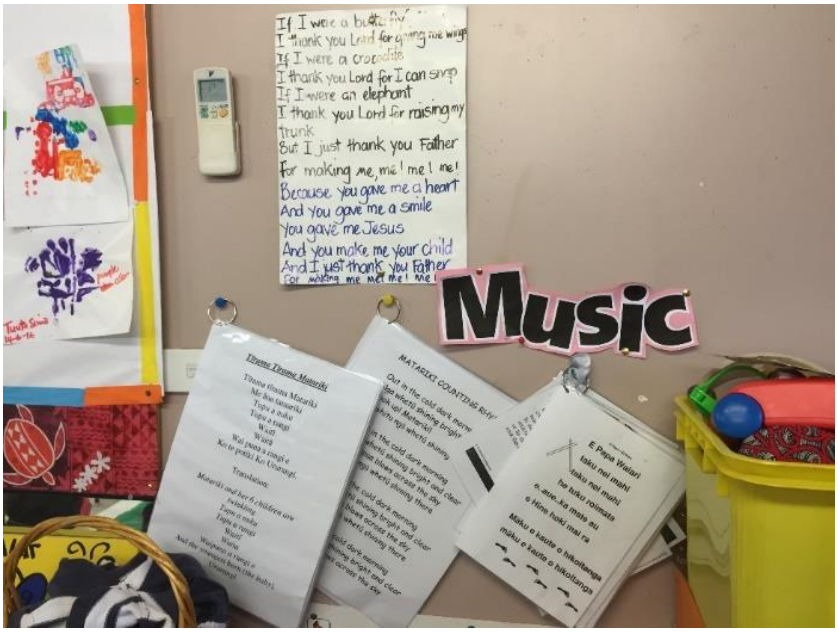


Figure 6c.8: Lyrics to songs reflecting Māori and English language presence and use in the centre and illustrating the centre's connections with the church practices in the Transition room (2016).

Cultural practices associated with traditional Samoan home life were also incorporated into the daily routines at the centre. For example, everyone sitting together to eat (sometimes on the floor), including the staff. Educators and children always said a prayer before eating (Figure 6c.7) and when the children slept, they lay down with their heads together. In 2016, Gus said he thought that children experienced similar cultural practices at home, although there would be variations amongst families.

> And we know for a fact that that's what the parents are doing as well at home. They'll say their prayer before they eat every single time. They'll always eat together, and at home they could be on the table or they could be on the floor, we don't know. But that is some scenarios that we can get. (Gus, 2016)

Official details of home language environments were not formally collected from families, as the home language environment was understood through knowing the children and their families through daily interactions. Listening to children's stories and interactions was a particular aspect of the planning at the time of interview in 2016 and a focus for learning stories.

> And the main reason why I thought that would be a good topic, because we have a lot of the new kids from that group, from the under two move into here, and then we have new kids from home. Because I thought it would be good for the teachers to really listen to the children's' voices. So that was the main reason I put that. Language and communication so they could observe and hear what they're talking about. Yeah because most of the time, we're too busy, we're not really listening to what they're saying. So it would be really good to catch some of their conversation and listen to their languages. (Sefina, 2016)

The variation in children's Samoan language use may have had correlations with their parent's country of birth. Sefina said she had observed common language practices between children with Samoan New Zealand born parents; they understood Samoan language but answered in English.

> But those ones that say the words in te reo Māori and English, they can understand Samoan, but they answer back in English because that's what I noticed with most of the children that are born here. That even though they can understand, they can't speak to you in that language. (Sefina, 2016)

Sefina said she considered that children mainly spoke the language they would hear most at home.

> Yeah. I think it's, they mainly speak what they hear at home, because when they go home, that's whatever language they speak at home, that's when they come to school they come with that language. We're like the reminders of the other language. (Sefina, 2016)

Observations of children for the purpose of writing children's learning stories was an opportunity to also observe how children were using languages within the centre. There was no policy on language choices for learning stories and choices were dependent on the educator's level of Samoan. The profile books were not observed as available for children to interact with in the Transition room in 2016.

> Yeah. And their stories. When we're observing, like we do observations, we put them in their profile books. We can hear that's a good time to listen to ... a lot of the times it's hard because you can't just follow every child and listen to ... but I do hear some of them speaking Samoan, some of them talk English. But even though they talk English they can still understand Samoan. (Sefina, 2016)

The proximal processes were multilingual and were predominantly to support the presence and use of Samoan language to create an immersion environment. Samoan had power over English and Māori, though proximal processes in the form of Samoan at times was not bidirectional with children and were dependent on the adult's Samoan language resources.

Interacting with digital technology in the virtual linguistic landscape

The Transition room had one computer for the children, with puzzles and maths games, and there was one computer in the centre manager's office. Sefina would access resources online to use within the centre environment, however all of the resources online were in English so Sefina adapted the resources to incorporate Samoan language or extend the degree of Samoan language complexity.

Figure 6c.9 shows a display demonstrating how to sign colours in New Zealand sign language with English and Samoan adapted by educators and observed in the Transition room (2016 and 2017).

> They're all English and then I just [add] Samoan words in paste. I've gone on to some Samoan websites, but there are not much; couldn't find much and when they did explain Samoan it was just one word, and then you think "oh, it's not as much like when you go on an English website, where sometimes you could search one word or another. Samoan, there wasn't much, so you've just got to put your own words. (Sefina, 2016)

Figure 6c.9: A display demonstrating how to sign colours in New Zealand sign language with English and Samoan created by educators and observed in the Transition room (2016 and 2017).

Many of the displays in the centre contained Samoan. Most of these displays had to be translated by the staff. Gus said the use of DT within the centre was “driven by teachers” (Gus, 2016) and depended on each educator’s level of comfort with using DT. Both Gus and Isla perceived DT as a tool to contribute to the ECE centre programme. Despite having limited DT within the centre, Gus said he perceived DT use within the centre as “beneficial for anyone” (Gus, 2016), particularly children with limited exposure to DT in the home environment. Gus said the next step would be to get iPads for the children as primary schools were using them as a part of their programme. The centre managers were particularly interested in creating their own Samoan language digital resources for children to support their development of Samoan language across educational settings and home environments.

During my engagement with Gus and Isla, we worked together to develop a Samoan language resource that could be shared with other ECEs in the community to enhance their LLs, with a QR code that linked to YouTube with an audio file of the Samoan immersion centre’s educators and children singing the song *Patipati ou Lima* (see Appendix 3). This poster was an example used in the workshop in Case Study Two on using DT and QR codes to enhance the presence and use of minority languages within the educational settings.

6c.2.2 Home Environment Proximal Processes in 2016

In the week of gathering the first LL at the Samoan immersion ECE in 2016, I met with the two caregivers Gus had arranged for me to interview. It was around 9am in the morning and both caregivers had young children attending an ECE session that day. We began with introductions; Eve and Jemma had not met before and both agreed the interview was an opportunity to connect with another caregiver in the centre. The microsystem home environment in this case is of Eve's emergent bilingual Samoan child, Anela, who had attended the Samoan Immersion ECE centre and had recently transitioned to a mainstream primary school. Eve's two younger children were attending the centre. Both Eve and her husband were Samoan, they both spoke Samoan and English fluently. Overall, the home environment had up to two languages with English as the primary language. Extended family and church connections were additional environments with Samoan language use. The home environment had various DT devices that Anela interacted with, with all activities in English only. Eve expressed concerns about the loss of Samoan language for her own children in their transition to mainstream primary school. With Anela recently transitioning to primary school from the Samoan immersion ECE, she said was she was unable to see any visible evidence of Samoan language or culture in the classroom. She referred to an example of her friend's son that indicated that the lack of linguistic and cultural expression within the educational setting influenced the child's social-emotional wellbeing. She concluded that this lack of visibility reflected a lack of value of the child's culture, which could be interpreted with what Doolittle (2014) would describe as the child's schema, in order to engage the child in learning and build on their existing internal models. She said she believed this contributed to his negative emotional states within the classroom, such as anger and boredom.

> When it came to Samoan language [in the primary classroom], they didn't have anything. Nothing at all, which kind of shocked me. There's a lot of other [Samoan] students there. A lot. And it's like my friend's son, he's at a school as well and it's like you need, it matters, Samoan, it's like this uncomfortable token, you know, it's making this boy really angry because he's got nothing to do, you know? (Eve, 2016)

Though it is not clear what Eve meant by "uncomfortable token" it could indicate that her preceding comment of "you need, it matters" implied there were disparities between the level of parental value and demand for Samoan language inclusion and a mismatch in the educator response to the demand. Her discomfort with tokenistic use of Samoan language in Anela's primary classroom appeared to be connected to the feelings she had experienced attending an intermediate school, a predominantly mono-cultural English dominated educational setting. Thus, it is likely that her interpretations of the emotional impact on cultural and linguistic resources not being visible within the educational setting

were grounded in her own experience of social exclusion based on her Pacific identity. She held aspirations for educational settings to authentically incorporate cultural visibility and studies for the growing Pacific Island communities.

> I was in intermediate [school]. It was very, very posh back then. There was barely any [Pacific Islanders]. I didn't even want to be an Islander because I was speaking a different language than everyone else and everyone [else] was on the same page and I just felt really left out. I hope in primary schools they do incorporate more Pacific Island studies at least because there are a lot of Pacific Island communities in [this city]. (Eve, 2016)

Extended family also served as an example to inform Eve's beliefs around Samoan language maintenance. When Eve spoke Samoan to her niece and nephew, she said neither were able to comprehend or speak Samoan, despite being raised in Samoan immersion homes with close intergenerational links to Samoan speaking family. The children also did not communicate in Samoan language within the home or the educational setting of a mainstream primary. Both Eve and Jemma agreed that it was not necessarily possible for children to acquire Samoan language in New Zealand even if the home environment was rich in Samoan language.

> Eve: Because my other sister, her partner's full Samoan, from Samoa. She's Samoan as well, and they speak Samoan all the time at home. But her daughter, also the same age as my nephew, doesn't understand it.
> Jemma: [They] just aren't picking it up?
> Eve: She doesn't speak it. They're just not [learning it].
> Jemma: I think if you talk it around them, it's not the same.
> Eve: Yeah. Yeah, I know. That's why I've put them in this school.

Jemma's reference to "talking it around" children as not being sufficient for language acquisition could indicate that she thought direct language instruction or direct language interactions were necessary, which Eve agreed with and said this was an additional reason for enrolling her children in the immersion ECE. Eve was uncertain about her children's future and their ability and opportunity to retain the Samoan language they had acquired at a young age. She expected her children's Samoan language and culture to be less incorporated into their educational experience at primary school. Due to the anticipated lack of Samoan language and culture within the primary school setting, Eve expected that in the future the home environment and extended social connections might become the primary source of Samoan language maintenance.

> So yeah, it'd be interesting to see when they're a lot older if they actually hold onto their language. When they go to primary, it probably won't be a part of their day-to-day. So we have to incorporate it more outside of school just to keep it up. (Eve, 2016)

The influence of time on her own language acquisition experiences and through the observation of experiences of extended family shaped Eve's interpretations, motivations and aspirations for her children's Samoan language development across the home and educational settings. There was some frustration in relation to the level of response educational settings made in relation to increasing the visibility of children's cultural and linguistic capital, given the level of importance and value Samoan caregivers placed on their Samoan identity and its relation with socio-emotional wellbeing.

Proximal Processes within the home environment

The proximal processes within the home environment microsystem involved interactions in English and Samoan with a variety of family members and the church. The shifting power, direction, content and form of those interactions vary in the following descriptions.

Presence and use of minority languages

Given the limitations on gathering linguistic landscape data from within the home as the interview was undertaken in the ECE centre, Eve was asked if there was any Samoan language visible on the walls within the home environment. From her recollection of her home environment and interpretation of the definition, she said the LL of the home had limited visible language, some English and no Samoan. There was cultural decoration in the hallway of the house; this was seen to reinforce her children's established and ongoing knowledge of their Samoan identity. The children had a chalkboard for writing on which was mostly used by the children to "scribble".

> I've got [cultural decoration] in the hallway and the kids know that they're Samoan. In their rooms, they have mathematics stuff and English, and their colours, their numbers. (Eve, 2016)

Eve enhanced the language environment and supported her children's Samoan literacy by visiting the community library, which held a collection of children's books in Samoan language. In the interview, the only mention of Samoan literacy in the home environment was the connection to the community library's Pasifika book collection.

> We always go to the library on a Wednesday and I get my kids to go to the Samoan section and always pick out one book. (Eve, 2016)

The home language environment had occasional Samoan language use and Eve considered that as a family they were not speaking Samoan in the home. Eve and her partner spoke mostly English to one another, or started communicating in Samoan and then finished in English. The linguistic choices and communicative behaviours may have influenced their children's linguistic choices as the children also predominantly communicated in English despite initiating communication in Samoan.

> At home [my partner] and I speak more English than we do Samoan. So my kids are speaking, they'll start off with Samoan and end up with English. We both understand [English] because even [my partner] speaks fluent English. (Eve, 2016)

The children's father was a New Zealand born half Samoan/European. His mother and grandparents spoke Samoan to him growing up as a child. Eve said she considered that her husband was quite fluent in speaking Samoan but had difficulties with reading and writing in the language, inferring that his literacy skills in English were stronger than in Samoan. Considering Eve's identified strength in English, her partner's weaknesses in Samoan literacy, and both their formal education was in English only, it was possible the most fluent and effective language for communication in the home was English.

The dominance of English as the language for communication within the home environment appeared to prompt Eve to use strategies with her children to encourage Samoan language use. Eve developed a motivational tool to encourage Samoan language use within the home. This involved the use of extrinsic rewards (stars) for language use, such as comprehending and responding to simple instructions in Samoan. Her children's response to language instructions, such as "pick it up", served to monitor her children's level of Samoan comprehension and "has also has helped unlock" (Eve, 2016) the Samoan language.

> So I'll say just little things like that just to see if they actually understand and actually if they complete the command. (Eve, 2016)

This reference to "unlock" the Samoan language indicated that Eve considered her children to have invisible language resources in Samoan that needed opportunities for expression in the home environment and across other microsystems. Despite her children initiating interaction in Samoan, the dominating power of English within the home meant both children and adults finished interactions in English despite the intention to communicate in Samoan. The language and cultural cues within the home were limited to the hallway and were not present in the main living areas of the home where conversations may have been more likely to take place. It seemed clear Eve faced challenges in sustaining Samoan language use in the home environment, as the power of English both within and beyond the home was too dominating. The domination of English in the home occurred despite Eve's strong motivational force for her children to acquire Samoan.

Anela had completed the Samoan immersion ECE and had transitioned to mainstream Primary school. The language environment of the primary school classroom was seen to be influencing the languages used by Anela within the home environment. The expression of Māori as an additional language in the home was perceived by Eve as an advantage as Anela. However, the communication of Māori in the home environment was at the exclusion of Eve, as Eve did not comprehend Māori. This reduced the opportunities for reciprocal language interactions in Māori within the home to develop the additional language across settings.

> You know what, my daughter [had] Samoan [at the ECE], she came when she was one. And she left when she was five and she knew all the Samoan. Now, she's picking up a lot of Māori at school. She's coming home singing it, talking it. She's doing *karakia* [prayer] and that. And I'm like, "What are you saying?" Crazy. And I like it because she's getting three languages out of it. (Eve, 2016)

Eve did not mention in the interview if the primary school shared Māori language resources with families to reinforce the language learning within the home environment, nor whether Eve actively sought Māori language content through other means, such as online or through television.

Interacting with digital technology and the virtual linguistic landscape

The home environment had multiple technological devices with an internet connection within the home that both children and adults had access to. There was a television, laptop, iPads and each adult had a smartphone. Based on the interview, it appeared the majority of her children's DT use was entertainment in English only. Eve said one main purpose for children's DT use was to allow her time to manage household activities and tasks. It also allowed her time to herself. Her personal access to Samoan language content using DT was limited. Her only online exposure to Samoan language and culture was with the immersion ECE; this implied all other content in virtual form was in English and for information and entertainment purposes. When discussing how DT was used with her children in the home environment Eve considered herself "bad". DT use was managed in ways that were functional for herself. The intensity of parenting three children under five years old while both she and her partner had work outside of the home was alleviated by the use of DT as it assisted her in practical and emotional ways. However, using the DT for alleviation came at an emotional cost of a negative self-appraisal of both her parenting and her own overuse of DT. There was a sense of shame associated with admitting using the technology to "help" her manage day-to-day.

> I'm bad at that. I'm really bad with it. When I need some time alone, I'm sort of like, "Who wants to watch Netflix?" But we do that every morning. And I'm like, "Okay. There's the Netflix over here, and there's the laptop over there. Who wants the iPad?" I'm like, “Which one?” So, I'm really bad like that. (Eve, 2016)

Despite her negative self-appraisal of DT use, Eve added clarification on how the intensity of parenting allowed little time for herself and tasks within the home “they're always with me, all the time” (Eve, 2016). Eve said that an additional appeal of the DT was that it reduced disorder, or chaos, in the home compared to if they were playing in the physical space without the DT. This would seem that the DT use might be reducing the opportunities for the children to play in more physical ways within the home as the DT facilitated use that is more sedentary.

> Because I need things done, but they're always with me, all the time. I'm the type of person, I don't like my house messy. So they have to be sitting there. So, technology has, I'm so bad, has helped me out a lot. (Eve, 2016)

When asked why she considered herself “bad” that she used technology she viewed the screen time as reducing the time she had to interact with her children. From her comment, it would seem that Eve viewed her children’s DT use was supported by her want and need for time for herself. Given that Eve was a working mother, managing a household with three children under five years old and a commitment to contribute to the church, it could be assumed that her time was limited.

> Because I'm actually putting them in front of a screen, which [is to say] I know I'm not interacting with my kids. (Eve, 2016)

Her comment would also suggest that the DT used in the home was not a shared experience with her children and that her children were likely to engage in solitary use on individual devices. Eve did not state in her interview if the children’s activities on the DT were interactive or if DT facilitated interaction between her children. Eve considered her own personal use of DT as “big” and she noted that she spent a significant amount of time browsing social media and search engines, to the point that she felt that she had reduced control over her own use and limits. The inference could be that the use of the DT was not intentional or purposeful use on her part and instead more likely habitual browsing. The lack of control over her DT use represents the power DT had over her attention; the attention that she acknowledged could be better given to her children.

> Yeah. Because I think it's also a controlling us. So I'm really big with technology. I wish I wasn't ... but yeah. Sometimes I Google a lot. I just go on Facebook, everything else and check my emails but I don't know why it takes me so long just to go through it. (Eve, 2016)

In this case, the parental DT distraction was often interrupted by requests from the child and their need to engage. Verbal requests escalated to physical requests for attention when Eve's children did not receive her full attention. Eve acknowledged that when her children requested engagement she was able to hear her children but did not give them her full attention to comprehend what they were saying, as revealed by the conversation with Jemma.

> Eve: I get this [tapping on my arm] I said, "I'm on my phone", they're talking to me and they'll go, "Mum"[and continue tapping]. So then they come and they do this [tapping on my arm]. Just to get my attention. Because I can hear them, but…
> Jemma: Obviously, you're not [listening to them]. They want the eye contact, don't they?
> Eve: Yeah, Yeah
> Jemma: So I have put my phone down a lot lately.
> Eve: So have I.

Both caregivers in the interview recognised this demand for attention in their children and acknowledged their children's desire for full communicative attention. Eve and Jemma had recognised their need to intentionally limit their own screen time by physically putting their phones down. Through the shared acknowledgement of their own digital behaviours and the impact on social engagement with their children, both parents were empowered enough to prompt a change in DT behaviour for the benefit of their children. This perspective may have been prompted by the emergence of thinking that stemmed from the interview.

Admitting that DT use within the home was "big" required a level of vulnerability, exposing herself to potential judgement within the interview setting. However, both the interviewer and Jemma could relate to the challenges around limiting DT use. As Eve was unaware of how other caregivers were using DT within their home environments. Eve could compare her DT use to observing parental DT use in environments outside of the home. Her admission to being "big" with DT was her perception of use as there was no objective measure to quantify her self-perceived measure. Eve could observe other parent's use of DT and recognise the negative implications of DT distraction on the attention given to their children in an inner-city outdoor playground. This reinforced to Eve the negative socio-emotional consequences of parental distraction on young children.

> You know, yesterday I took my kids out to [an inner city playground], I see a lot of kids playing around and the parents are on their mobile phones. I felt really bad for [their children]. (Eve, 2016)

The observation of other caregivers using DT in the playground would suggest that Eve might have had some limitations to how and when DT was used in environments outside of the home. For

example, Eve was likely to have had self-imposed limitations on the use of mobile DT in outdoor environments, spaces she considered were intentionally designed for young children and their caregivers to play and interact together. In the home environment, it seemed that DT use displaced proximal processes between the caregiver and her children. Given that all the content accessed through DT was in English only, it may have contributed to the lack of presence and use of Samoan language within the home environment. Additional contexts, such as the ECE, the church and the community library, were therefore crucial for proximal processes to support the presence and use of Samoan language in the children's lives.

6c.3 Mesosystems – Caregiver and Educator Proximal Processes in 2016

The mesosystem of interest was the interactions between the educators and caregivers of the emergent bilingual young children and their associated home environments. Both the educational setting and, to a lesser extent, the home environment of the emergent bilingual child in this case have been described in detail to appreciate some of the proximal processes that support the presence and use of minority languages in each setting. The proximal processes were defined as interactions with people, objects and symbols, this included DT as an object within the environment and the languages as the symbols visible in the LL of the educational setting, both physical and virtual.

Proximal Processes within the Mesosystem

The proximal processes identified from interviews and observational data illustrates the interactions between the caregiver and educators of the emergent bilingual Samoan young child between their associated microsystems. The Samoan Immersion centre was a significant support to the child's Samoan language development, with mesosystem interactions strengthened through DT interactions that included proximal processes intended to support Samoan language presence and use in the home environment.

Presence and use of minority languages

Sefina expressed the value of community engagement, as it was essential for supporting the Samoan language development, particularly for those with limited presence and use of Samoan within the home.

> When they're in the community, all those people there speak the language and that's how they pick it up. So it's good when they go to church but I reckon if they are not being involved in the communities then they would lose it if their own parents are not talking at home. Yeah. (Sefina, 2016)

Sefina encouraged caregivers to use Samoan language within the home environment by strengthening connections with extended family and older generations fluent in Samoan. Her advice stemmed from her own experience of challenges using Samoan language with her children growing up in New Zealand with a non-Samoan speaking New Zealand European husband.

> Yeah, I think at home mainly. Like with encouraging the parents to keep that language alive and families, because they do have a lot of extended families. So it's mainly the grandparents and the older generation that speak the language, so they are around. Always encourage their children to speak. [Grandparents] are really the ones that are important about keeping the language alive. (Sefina, 2016)

Eve said she recognised that the external environments of ECE, the church and connections with extended family were necessary for the continuation and ongoing maintenance of her children's Samoan language. She considered other situations of young children losing their Samoan language despite the exposure and use within the primary family home were similar to her own children. She said she felt her children's future in a mainstream primary school placed them at potential risk for losing their Samoan language and language maintenance was a family responsibility.

> And I guess that's where to continue for my kids. So we have to incorporate it more outside of school just to keep it up. (Eve, 2016)

Eve said she felt empowered enough to be able to enter the educational settings and advocate for the needs of her children. When Jemma asked Eve if she could "go into a school and be like, "I really want my son to have more involvement in this." Eve responded "Absolutely." However, this was not always the case for Eve. When Anela first attended the Samoan immersion ECE, she felt less likely to enter the centre to engage with the educators. Eve's parental empowerment had evolved over time.

> When I first came here, I didn't know anybody because most of the time, my daughter came on the van and I was still pregnant with my son, so I knew nobody. But the first time I came in, it just felt a bit unwelcoming to me, so I never came back. Until I had my last son, I was

> like no, I'm going back on a new foot. So every time I come in, I go "Hi ladies, how's it going?" Coming in, I'm just like "No, I'm going to make an effort, I'm going to say hi." (Eve, 2016)

Eve and Jemma had shared similar experiences of their own parents' disempowerment. Both said their parents had not been involved or were uncomfortable engaging with educators in the educational setting. The difference between their own empowerment and their parents' disempowerment was interpreted by both Eve and Jemma as a generational change, as they both felt more empowered than their parents were. Parental engagement was a challenge faced by the educators and centre managers. Certain centre events would require caregiver help, with which Sefina said the centre always had a good response from caregivers, which allowed the educators to record the children's experience with photos that included caregivers engaging in the centre programme.

> And when they did come to the parent meetings, the interview, it was really lovely having them there, and having their thoughts but it's still quite hard to keep them here most of the time. I guess that's because a lot of them are busy and have got their own lives and responsibilities, like working. But their learning still links to everyone else's even though they prefer to do things on their own, it's not separate. It's not apart from what the others are learning. Like the families and that. So I can sort of relate it to the families with the children's learning. Even though the families are not there, whatever they're learning at home interconnects with what they're learning at the centre. And that's why I think it's really, really important to know what they do at home. That connection with them. (Sefina, 2016)

Connection between the ECE centre and home environments was identified as important for supporting children's learning. Given the pressures of work and limited time, all the teachers expressed the challenges in developing those links and encouraging parental engagement. Much of the communication between the ECE and the centre was in the written form. Formal learning assessments as learning stories were collated within a book that children could take home. As mentioned, Samoan literacy levels varied amongst the families attending the centre. This variance in Samoan literacy was also an issue amongst the staff and educators at the centre, so communications were kept simple to reduce misunderstandings. Forms and policies for caregivers were also kept intentionally simple.

> We have a real issue here, well, it's not an issue but for me, my written Samoan is not even great. So for me to connect with some of those who have got Samoan right through their house can be a bit of a challenge. (Gus, 2016)

A contributing factor of parental disempowerment for this particular ECE centre was the lack of opportunities for some caregivers to physically visit the centre, especially those utilising the centre van service. Although the van brought children to the ECE centre, it reduced physical presence to

connect with their children's teachers and their learning. For Jemma, the portfolio book containing learning stories was only accessible from the van, as the van carried the children's portfolio books to ensure they were not lost. This was also the case for Eve when Anela was attending. The portfolio book with learning stories was identified by Eve and Jemma as vital for connecting with their children's experiences in the ECE. Without knowledge of the activities in the ECE centre, conversations about the child's day at the centre were limited. Eve encouraged Jemma to seek more information from the teachers.

> Well, you should ask, just say, because when I had the parent meeting I said, "I barely know what my son's doing each day. He doesn't really talk about what he does." (Eve, 2016)

Despite the van service being convenient, the engagement with their child's learning was difficult. Both parents had subsequently chosen to pick their children from the centre personally so that they could better engage with their children's learning. Gus said difficulties connecting caregivers with children's learning in the centre was an issue due to caregivers work commitments, lack of time, living far away from the ECE centre and use of the van service. Gus expressed the need for engagement between the home and the centre to be bidirectional.

> And that's the real challenge, for our centre anyway, is the parent engagement. Because a lot of our parents here are hard working parents, who work fairly long hours, and they aren't able to try and engage with us. But they are really reliant on us about, of us handing them information, for us we need it both ways, so they need to let us know what is happening. That's always going to be the challenge for us. (Gus, 2016)

The intention for the next year was for learning stories to be on PDF format so that learning stories, normally published within the physical profile book, could also be sent electronically via email. Engaging with caregivers through DT had the potential to strengthen the caregivers' engagement with their children's learning.

Interacting with digital technology and the virtual linguistic landscape

The Samoan immersion ECE used email, paper newsletters, paper learning stories, a Facebook page and website for connecting and communicating with caregivers. The Samoan literacy amongst families varied so very basic Samoan and English language was used. In 2016, screenshots of the VLL of the educational setting showed children's learning experiences within a Samoan context were shared with caregivers and the community networks through Facebook. This is an example of the VLL enhancing the presence and use across the microsystems of emergent bilingual young children across their microsystems. Connecting virtually was an additional means to support caregivers' engagement with

children's language and learning. The centre used DT and online platforms for strengthening the home and centre connection. The centre had a website, Facebook and email. An example of communication were the centre newsletters posted on the website. Prior to the website, newsletters were emailed, prior to that they were printed on paper. One issue raised by Eve was that not all caregivers had a level of Samoan literacy sufficient to comprehend written information from the centre. Therefore despite the online environment creating a third space for home and centre connection, the level of literacy necessary could exclude some families and potentially create a power imbalance both between the centre and home, and possibly between adults.

> Well before the website came up, they used to send out newsletters in Samoan. My partner, because he doesn't understand when he reads it, he doesn't understand. But [people like my partner] can read it but they don't understand it. (Eve, 2016)

Artefact 4 - Facebook

Of all Eve's DT use mentioned in the interview, the only connection to Pacific Island languages and cultures was via the ECE centre's Facebook page. As most caregivers at the centre worked long hours, the centre would normally use telephone to contact caregivers but saw Facebook as playing a significant role in connecting with caregivers and sharing information. Facebook was viewed as a vital online platform for connecting with families with physical and time constraints that reduced their opportunities to engage.

> Because a lot of our kids get picked up and dropped off, and that's another barrier that we've got. It's good for us that we are getting the kids here, but it is a barrier for us at the same time where we can't connect with the parents because they're working so much. So that's where Facebook plays a huge part for us just in terms of what we are up to on a daily basis. So I guess that is probably our biggest link that we got. (Gus, 2016)

The centre estimated that a large proportion of their families had Facebook. Content that promoted the centre, activities and events was posted on open page and excluded content relating to individual children. Information that was more specific was reserved for the monthly newsletter. The intention was to create the newsletter in PDF and to email, as email was considered more secure. Eve's exposure to additional Samoan language on Facebook would only occur if any of her Samoan friends had written in Samoan in Facebook posts or comments.

> The only thing that probably Pacific Island on my Facebook would be [the Samoan immersion ECE centre] unless it's other Samoan people that have actually written up stuff and so on. (Eve, 2016)

The centre managers uploaded content to the Facebook page. Teachers who had the centre as their place of work on their personal Facebook page were associated with the page and had the possibility to "friend" caregivers. This enabled teachers and caregivers to follow personal Facebook pages that could provide an insight into each other's personal lives, giving bidirectional visibility between home and the ECE centre.

> [Being friends on Facebook with parents I have an] idea of what's happening at home. Some of them have posted photos of their kids on their own page because we're friends I can see them and make comments on them. So I guess that's another way of connecting with them. Probably most of these parents are on Facebook on their phones if they haven't got their computer at home. They've got iPhones. Yeah, [younger parents are] more into the technology. (Sefina, 2016)

Bidirectional visibility could serve as an advantage to the educators for strengthening the conversations in the ECE centre. Much of the language interaction between the educators and children were around children's experiences outside of the classroom. However, this could also raise concerns around privacy and the issues around how much ECE centres need to know about children and their home environment. The centre did not have any data in relation to the DT use within the home environment of families and said they found it challenging to consolidate all of the information to serve administrative and educational functions.

> We know a good chunk of the parents have got Facebook pages. The other question is whether they have got email addresses or whether they have got facilities to email or whether their phones are synced to email those are all questions from an admin point of view take really long time and effort. We know there should be a lot of people on Facebook. We are just currently getting a whole bunch of emails at the moment. (Gus, 2016)

The value of Facebook as a virtual platform for connecting with caregivers was financially more appealing, as the no cost and ease of effectively communicating information to caregivers made it a preferred platform for the future direction of parental connection and engagement.

> But that, in essence, is what we are trying to do is trying to think about the most cost-effective way to get information out to parents. And that's definitely by email, and in terms of the content, about what the school is doing in general, what events are coming up, Facebook is the way we are wanting to go. So that's our technology start anyway. We find email probably the best way to do it, and then Facebook is pretty easy. (Gus, 2016)

Given the lack of knowledge the centre had on the DT use within the home environment, the active promotion of engagement with DT through posting children's learning on Facebook may have both

costs and benefits for children and their families. In the case of Eve, although connecting with the centre was the only online virtual platform with Pasifika content, the self-identified "bad" use of social media platforms was seen by Eve as reducing her interaction with her children, distracting from her interaction that was necessary for her children's development. However, the Facebook posts may have contributed to enriching the home language environment and could have served as a reminder for Eve to interact with her children in Samoan and provide an opportunity for caregivers to enter the children's world of the ECE centre.

> Facebook is good, this connects for the parent. You write the notes in the learning story to show up [on Facebook] because that's good for some other person that comes to the pre-school and they show how they do it in the pre-school, with the kids, to connect with our community and the parents as well. (Sefina, 2016)

Caregivers faced a number of limitations that restricted their power within the mesosystem proximal processes needed to support the presence and use of Samoan language across children's microsystems. Time and distance from the centre limited engagment with educators and their children's learning. However, the caregivers' perceived level of empowerment was greater than what both Eve and Jemma had experienced growing up.

6c.4 Time –The Linguistic Landscape of the Educational Setting after One Year

Over the ten months since I last visited the Samoan immersion ECE centre, I had engaged with the centre in a number of ways, including connecting with the teaching team at one of the project's community workshops, and delivering the 2016 LL report I had written for the centre. Since my last LL in 2016, the centre had undergone an ERO review. In preparation for their review, the centre spent time developing their LL, this development was noticeable as I entered the centre for my second visit in 2017, as the entrance foyer was now decorated with a multilingual display mounted on tapa cloth. Figure 6c.10 shows the speech bubbles, each containing a country name, flag and greetings displayed on a Samoan tapa cloth located at the entrance of the centre (2017). The multilingual greetings and flag display mounted on tapa cloth decorated the circumference of the entrance walls. It was an indication that the developing philosophy of the centre, one based on a bicultural foundation and multicultural present.

Figure 6c.10: The speech bubbles each containing a country name, flag and greetings displayed on a Samoan tapa cloth located at the entrance of the centre (2017).

In addition, displays from 2016 had been updated in a way that represented a more consistent visual theme throughout the centre, such as the Te Whāriki display from 2016 (Figure 6c.1) to 2017. Figure 6c.11 shows the representation of the Te Whāriki curriuculum document with curriculum principles and strands in English and Māori in 2017. The display features a woven flax piece and is mounted on Pacific Island tapa cloth (2017). This display was located in a common area in the main building of the centre. The service roll in 2017 was around 42 children and a student-teacher ratio of 1:7 in the areas with children over 2-years-old. The ethnic composition of attending children in 2017 according to the 2017 ERO report was Māori 3, Pākehā/New Zealand European 2, Samoan 36, and Cook Island Māori 1, an increase in diversity from 2015.

Figure 6c.11: The representation of the Te Whāriki curriculum document with curriculum principles and strands in English and Māori. The display features a woven flax piece and is mounted on Pacific Island tapa cloth (2017). This display was located in a common area in the main building of the centre.

Isla found that an excerpt from the foreword in the Te Whāriki document was helpful in positioning Samoan in the bi-cultural context of New Zealand and the Treaty of Waitangi partnership.

> You're not discouraged in the fact that that's our history. You've got to acknowledge it. The Treaty was part of our history and that was a binding contract and that's what New Zealand as we know it was founded upon. Even with issues. So Treaty of Waitangi partnership. To understand that Aotearoa's bi-cultural foundation in a Samoan learning environment provides us with a multicultural present. This fosters a shared future in Aotearoa for our children and as global citizens. (Isla, 2017)

In 2017, I took 34 photos of all the wall displays in the Transition classroom, or a representative part of a display, to produce this LL. Figure 6c.12 gives an overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the Transition room of CS3 September 2016 (n=30) and September 2017 (n=23). In total, 23 photos contained linguistic items. Twenty of these displays contain some level of Samoan, of which 10 photos were in Samoan only. Four displays contained some level of Māori. Two displays contained a mix of English, Samoan and Māori. One

display with English and Samoan also contained Tongan. Not included in Figure 6c.12 were screenshots from the centre Facebook page (for example, Figure 6c.20 and 6c.21) or photos from the entrance and community areas of the centre (for example, Figure. 6c.10, 6c.11 and 6c.14).

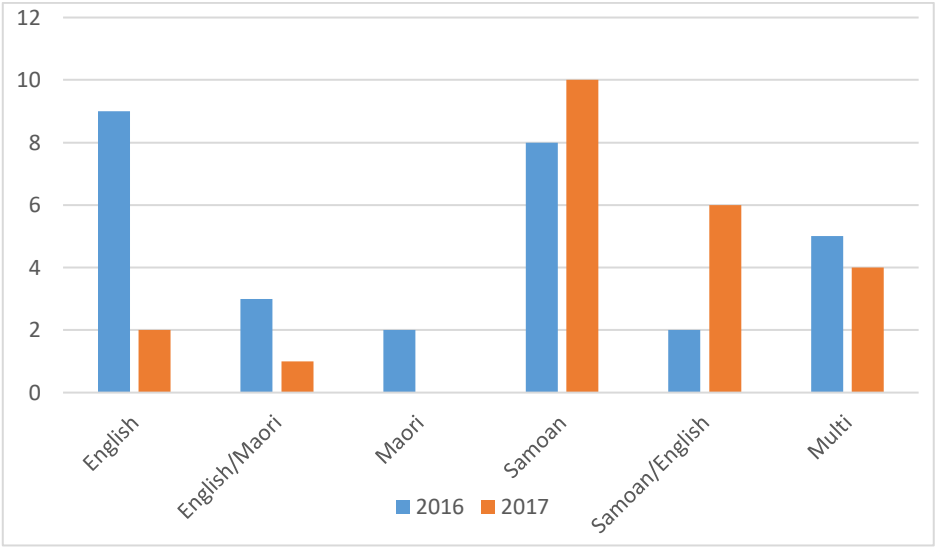


Figure 6c.12: An overview of photographic evidence, as categorised by language visible, in the linguistic landscape of the Transition room of CS3 September 2016 (n=30) and September 2017 (n=23).

The LL aligned with Gus's perspective expressed in 2017 that the primary objective for each room within the centre was to use Samoan language to create an immersion setting for children. Isla suggested the strength of language and culture within each area of the centre depended on the strength of Samoan language skills of the educators, more specifically Isla says "two really strong speakers" (Isla, 2017). This suggests that an environment with two strong speakers, as opposed to one educator, would create a more immersive environment for children.

> Just using it. The baby room is very strong in the language and very strong in the culture. You've got two really strong speakers and so the benefit is that you get to have that immersion from a really young age and create a foundation. It's probably 95% full immersion in that room and that's really cool. (Isla, 2017)

Isla said she believed that Samoan language use within the centre was incorporated into all aspects of life within the centre. This was observed in the LL with photographs of everyday learning with Samoan descriptions displayed in the Transition room. Figure 6c.13 shows photos capturing children engaging in centre activities (faces obscured) described in Samoan on display and at child height in the Transition room (2017).

Figure 6c.13: Photos capturing children engaging in centre activities (faces obscured) described in Samoan on display and at child height in the Transition room (2017).

Samoan was also not perceived as a language in isolation, therefore the emerging policy would incorporate the acknowledgment and celebration of other languages.

> It's a way of being, exactly. Its part and parcel you can't isolate it or separate it. So I think, for us, and the only reason why I say this because I reviewed all of our policies not so long ago, but it just didn't make sense to us later. We're going to talk about language as not just one language; there's many languages that we acknowledge and celebrate. The Samoan component is just part of us, it's ingrained in the whole, in everything that we do. So it's representative, for sure, but it's also ingrained more than that in our philosophy and vision and missions. (Isla, 2017)

In 2017, the centre had developed the Four Baskets of Cultural Leadership model to support the mission of the centre, which was,

> To serve our community by providing a learning environment that stimulates the uniqueness of the Samoan culture. By adopting the four baskets of cultural leadership we align and depict a distributive leadership framework in [this ECE centre]. (From Figure 6c.14)

Gus said he considered the application of the culturally relevant leadership model influential on the Samoan language use within the centre. The model empowered educators through collaborating on decisions within the centre. Figure 6c.14 shows the Four Baskets of Cultural Leadership display in the community area of CS3 to support the mission of the centre. This display was located in a common area in the main building of the centre.

Figure 6c.14: Four Baskets of Cultural Leadership display in the community area of CS3 to support the mission of the centre. This display was located in a common area in the main building of the centre.

Subsequently, Samoan language was observed to be a lot stronger by the centre managers. In one particular example, a New Zealand European staff member was observed facilitating mat time and was using English and Samoan language equally. This empowerment of language use had extended to this educator seeking further development in Māori language.

> And non-speaking Samoan staff, they've really sort of embraced the Samoan culture as well, so I can hear our [New Zealand European] staff member now, she's sort of doing mat time by herself, her content's about maybe 50/50 and answers in Samoan English. And now she's doing a Māori course, so she's adding more Māori-content in as well, which has been really good. (Gus, 2017)

In the interview with Gus and Isla in 2016, the centre managers were developing their conceptualisation of the curriculum document within the Samoan immersion context using the Samoan frame of cultural values. This conceptualisation was observed within the LL of the Transition room in 2017. Figure 6c.15 shows the representation of the *Te Tiriti o Waitangi* [Treaty of Waitangi] and Te Whāriki learning strands. This display includes multilingual greetings and associated national

flags in speech bubbles in the Transition room (2017). This conceptualisation aligns with the proximal processes described by the educators and centre managers associated to the LL.

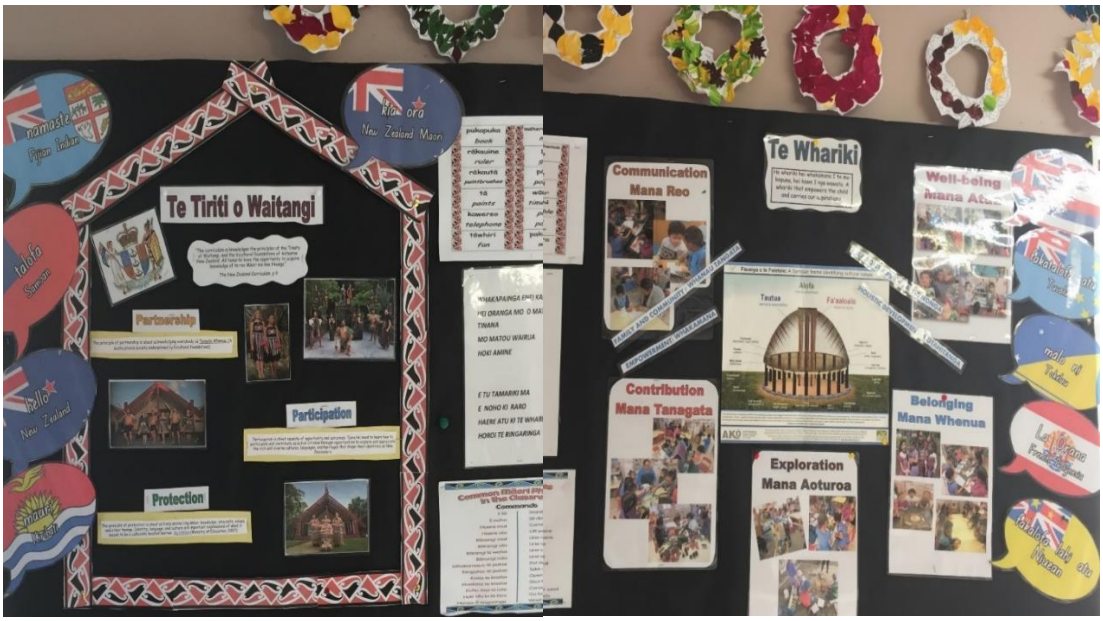


Figure 6c.15: The representation of the *Te Tiriti o Waitangi* [Treaty of Waitangi] and Te Whāriki learning strands. This display includes multilingual greetings and associated national flags in speech bubbles in the Transition room (2017).

In 2017, no additional DT was observed in the Transition from 2016. A desktop computer was available for children to use, and activities were based on how the teachers arranged to use the computer within their programme. At the time of LL data collection, a dinosaur matching game was open on the desktop computer. Figure 6c.16 shows the desktop computer situated in the Transition room with a dinosaur matching game, next to a dinosaur poster in the LL in the Transition room (2017).

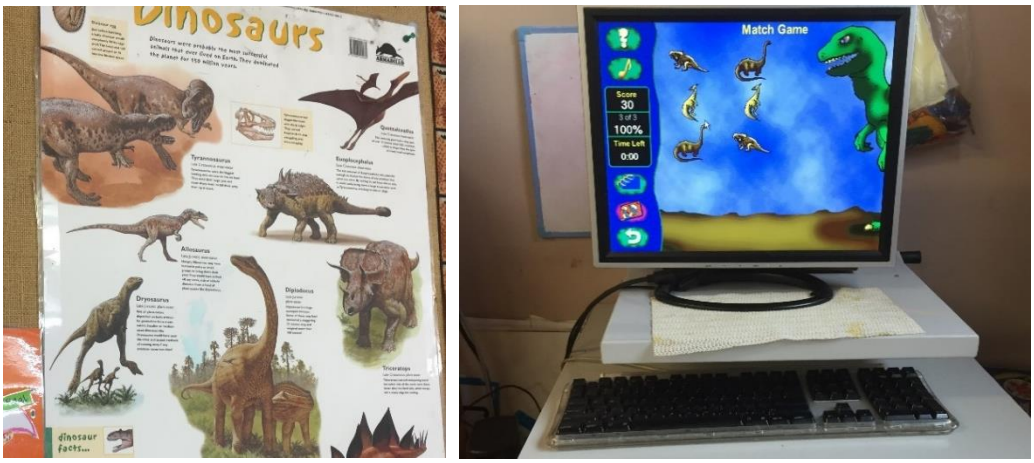


Figure 6c.16: A desktop computer situated in the Transition room with a dinosaur matching game, next to a dinosaur poster in the LL in the Transition room (2017).

The DT that was used within the centre contributed to the LL, in particular through exposing children to the sounds of different languages through music and stories. Isla spoke about how the use of the radio contributed to the ambience of the immersion centre, sometimes giving her the sense that she was actually in Samoa.

> It's a really lovely vibe in there, and they're always playing Samoan radio. Or there's local radio stations and it's mostly just the equivalent of talk back in Samoan. This is my personal perception because on sunny days, you'll hear them outside, the teachers cackling away and the kids there's sort of the hum of kids in the background and the Samoan radio ... it really reminds me of like a village that's sitting over in the islands or that kind of was quite familiar to me and how I felt when I was on the islands, so it's really nice. (Isla, 2017)

In 2017, the increasing use of the centre's Facebook page mediated bidirectional interactions between educators and caregivers, which supported the presence and use of minority languages across settings and community networks. Gus was empathetic towards caregivers raising their children with Samoan language and understood that there were challenges for caregivers who may not have had Samoan language. In previous years, teachers informally assessed children and their Samoan language abilities and responded in various approaches to mixing English with Samoan.

> What some of the teachers were trying to do previously was just trying to sort of assess which particular child in what level they're at and then sort of talking to them 50/50, jumble the sentences up in Samoan and English. Or they knew that at home Samoan was almost full blown when they're talking. (Gus, 2017)

The family structure was also an influencing factor on the home language use. Figure 6c.17 shows *Tulimanu O Aiga* [Family corner] in the Transition room (2017). Gus said that the use of languages in the home environments across all of the families attending the centre was a good mixture of Samoan and English, however, if there were siblings at home, it would likely influence the language used by increasing their likelihood of speaking English.

> I think it's a good mixture. I think if there are siblings at home, it will be English. If parents are home will be 50/50 in terms of how they speak, probably. I can only assume. (Gus, 2017)

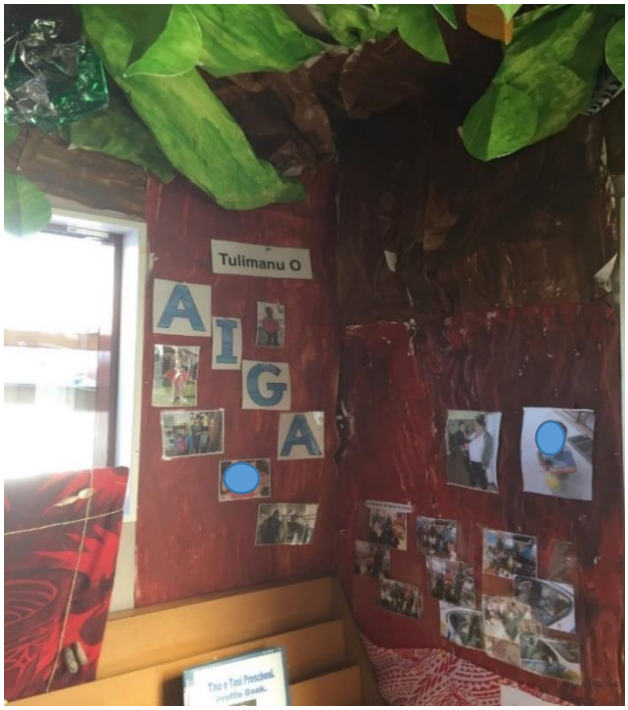


Figure 6c.17: Tulimanu O Aiga [Family corner] in the Transition room (2017).

Despite children responding in English, the teachers were confident that children understood the Samoan language and continued to use Samoan language with children, allowing those children to respond in English. The centre aimed to use as much Samoan language within the centre as they could, but added it was necessary for the Samoan language to be reinforced at home, particularly if the expectation was for their children to acquire the language. Reinforcing Samoan in the home environment included writing learning stories, shared with caregivers, in Samoan. Figure 6c.18 shows a learning story written in Samoan with photos of children's learning experiences, displayed on the wall and published in children's physical profile books displayed in the family corner of the Transition room (2017). Isla shared an example that came out of the parent-teacher interviews last term. The parent expressed concerns that there was not enough Samoan language in the Transition room. The educator responded by posing the question, "How do you communicate to your son at home?".

> We do what we can here, but you've also got to reinforce it at home, as well. It has got be a collaboration process, not just rely on us. So there's starting to be that dialogue with the parents. You can't just bring your child here and expect that they're going to learn it. You have to take some of that responsibility, as well, and take care of the home life. (Isla, 2017)

Figure 6c.18: A learning story written in Samoan with photos of children's learning experiences, displayed on the wall and published in children's physical profile books displayed in the family corner of the Transition room (2017).

The importance of supporting Samoan language use within the home environment was an immerging conversation with caregivers who spoke mostly English within the home environment. For some families with Samoan as a first language, English language use was considered the primary language within the home, which Gus said he thought was because families were aiming to increase their child's developmental progress.

> The very reason for that is trying to get their kids, trying to get them ahead, so to speak. So I think there's that perception as well, that they'll pick it [Samoan language] up later, type thing. But actually, sharing my story with some of those parents, about not having that language aspect from the start, they sort of resonated with that because they were like "I know because all my cousins are like that." (Gus, 2017)

In 2017, the HOC and immersion centre educators participated in a workshop held by Study Three of A Better Start in which this research was set. An expert on raising bilingual children encouraged families to speak to their children in their first language to support their child's bilingual language development. Figure 6c.19 shows the poster advertising the workshop for the Samoan community run by the Study Three team from A Better Start and shared on the centre's Facebook page *(*2017). After this workshop, Gus said the message they gave to their Samoan speaking families was to continue to speak to their children in Samoan. This message extended to the centre educators, so despite children's level of Samoan language production and home language environments, the educator's emphasis was on Samoan language. A follow-up workshop was then held at a Samoan church for the Samoan community in Samoan (Figure 6c.19).

> But I think what you guys are talking about, which is just keep saying it and eventually they'll get it. I think it's just in trying to find out what those parents are doing at home. Because I think that the course would be really beneficial for some parents to sort of hear and find out what it was actually all about. (Gus, 2017)

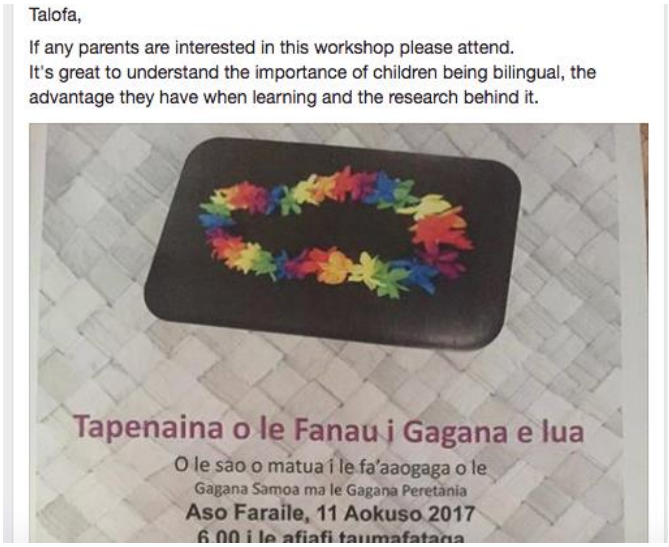


Figure 6c.19: Poster advertising the workshop for the Samoan community run by the Study Three team from A Better Start and shared on the centre's Facebook page *(*2017).

Artefact 4 – Facebook One Year Later

In 2017, screenshots of the VLL of the educational setting showed evidence of increased celebration of multiculturalism and multilingualism, with posts on Facebook celebrating Tongan and Māori language week. This aligned with the changes within the physical LL of the Samoan immersion centre observed in 2017 with increased visibility of minority languages. In addition, posts in 2017 contained videos of the children using minority languages, which were shared with caregivers and the community networks. Figure 6c.20 shows screenshots of the centre's Facebook posts celebrating Tongan Language Week and Te wiki o te reo Māori [Māori language week] (2017). These are an example of the VLL enhancing the presence and use of minority languages across the microsystems of emergent bilingual young children across their microsystems.

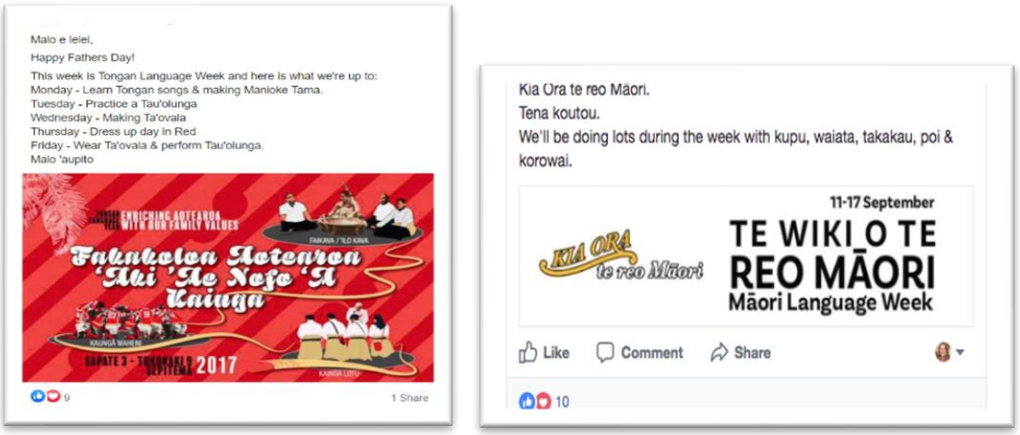


Figure 6c.20: Screenshots of the centre's Facebook posts celebrating Tongan Language Week and Te wiki o te reo Māori [Māori language week] (2017).

One advantage identified by one educator was that Facebook not only had the capability of showcasing the learning and activities with other ECE families, it could also extend the connection to the wider community networks. Figure 6c.21 is a screenshot of the Facebook post of a video including children celebrating Tongan language week with song and dance. At the time of the screenshot, the video had 1,500 views, indicating that the video was likely to have been viewed well beyond the immediate families associated with the centre and raising the ECE centre's profile.

Figure 6c.21: Screenshot of the Facebook post highlighting children's activities for Tongan language week, the children and educators (faces obscured) singing a song in Tongan (2017)

It was observed that in 2017, the ECE centre's Facebook page incorporated the celebration of multiculturalism and multilingualism by showcasing the children's minority language learning experiences within the centre with the families and Facebook community group. Facebook mediated the mesosystem proximal processes that supported the presence and use of minority languages across contexts empowering caregivers to engage in bidirectional proximal processes with educators and with their children's learning.

Summary of Case Three

The aim of this case was to illustrate the proximal processes and development of relationships mediated by the LL and VLL of the educational setting that supported the presence and use of minority languages within the LLs and how the LL of the educational setting developed after approximately one year. After one year the proximal processes, as framed by the LL of the educational setting, had developed. The immersion ECC was rich in Samoan, despite a higher number of displays with English only in the first year, Samoan was used more extensively throughout the centre in 2017. In addition, displays were decorated with traditional crafts and design (for example, see Figure 6c.6). Most of the educators in the centre were fluent in Samoan language and Samoan language was used with children within the centre a majority of the time, with the inclusion of English and other minority languages. In contrast, English language dominated the home environment; therefore, necessary external connections to environments with active Samoan language use were necessary to incorporate language use within the home.

In Eve's description of the visibility of Samoan in the home environment, the LL of the home environment had no visible Samoan language and a little cultural decoration to reinforce their children's Samoan identity. Eve and her partner both spoke fluent Samoan and strong motivational force for their children to learn, but Samoan language use with children in the home was limited. Eve's personal educational experience within mainstream educational settings and observations of the extended family appear to have informed her aspirations, motivations and concerns about her own children's Samoan language development in an English dominated society. Eve's perspective was that language, culture and identity were interconnected with social-emotional wellbeing. This was indicated in her recollection of her feelings of social exclusion as a Pacific Islander at school. Eve acknowledge that in order to sustain her children's Samoan language development her children would need support from multiple contexts, this included the Samoan church, the Samoan immersion ECE and hopefully her children's future primary school settings. However, Eve had concerns about the possibility of sustaining bilingualism in the primary school setting, as she was yet to see any visibility of Samoan language or culture within her daughter's classroom. The dominating influence of English also entered the home through the use of DT and the VLL. All members of the family had access to DT and it appeared to be used mostly for personal entertainment and information purposes with enough DT devices for each individual. Eve described herself as "bad" at using DT and indicated that the high level of DT use in the home was distracting from interacting with her children. Reduced interaction due to digital distraction may have implications for her children's language and overall development.

Eve said she felt like the DT 'controlled' her. DT distraction may have reduced the quality of interpersonal interactions; she would hear them but not comprehend what they were saying. The majority of content on DT was in English.

In 2017, after approximately one year, the LL was more developed with increased visibility of Samoan and other minority languages and reduced visibility of English. In addition, the Samoan immersion centre managers were using social media platforms to engage with caregivers. The bi-directionality and interconnected nature of Facebook allowed associated adults of the Samoan immersion ECE centre to become “friends” as well as share the ECE centre’s posts with extended family. For the parent in this case, the centre’s Facebook page was the only online environment she accessed that contained Samoan language and culture. The creation of posts on the Facebook page aligned with the centre managers’ intentions to develop digital resources in Samoan language to support the development of Samoan language, subsequently enhancing the VLLs that interconnected the home environment and the educational settings.

Conclusion

This was an in-depth illustrative ethnographic case study of the linguistic landscape of the reception Year 0/1 classroom studio in a mainstream primary school of an emergent bilingual Chinese 5-year-old child who attended in 2017. This case study was interpreted through the Bioecological Systems Framework using the Process-Person-Context-Time (PPCT) model with home, school and community networks to support language development. The microsystems in this case were the educational setting and the home environment of the child, interconnected using DT and VLL associated with the educational setting. In this case, the child’s ECE setting significantly supported the emerging Samoan language development and created social, cultural and linguistic connections for the child. The visibility and use of languages in the home environment was predominantly English, with Samoan language used occasionally with individual words, phrases and songs. The parent in this case observed her child using Māori language across settings developing the child’s multilingualism. The centre was dominant in Samoan language with an equal presence and use of English and Māori language reflecting the centre’s mission to create a Samoan environment whilst following the Te Whāriki curriculum document and the bi-cultural commitments as set out by the Treaty of Waitangi. The centre was set within a community with a high percentage of ethnically diverse children, with the majority of children identified as Samoan

7. Discussion

Introduction

The aim of this thesis was to illustrate the LL (physical and virtual) of educational settings of emergent bilingual 4 to 6-year-olds growing up in Aotearoa New Zealand, viewed through the Bioecological Systems Framework that prioritised proximal processes with the application of the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). The PPCT model was applied in this thesis in order to answer the overarching question: How do linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? The purpose of this chapter is to bring together the three in-depth illustrative case studies presented in the previous Findings chapter to interpret and discuss the findings. This chapter begins with a summary of findings from the *linguistic landscape* (LL) of three educational settings. This summary aims to combine, compare and contrast to show how the LL of educational settings and the findings from the three case studies relate to the research questions set out in the Introduction chapter of this thesis. This is followed by interpretations of the LL of the educational settings in relation to current literature on LL and schoolscapes. Then, the discussion follows the PPCT model in order of Person, Process, Context, and Time, so that each element of the model is discussed in relation to relevant literature. The following chapter is the thesis conclusion and recommendations for future LL design, policy, theory and research.

The Linguistic Landscape of the three educational settings

The linguistic landscape of the three educational settings of 4 to 6-year-old emergent bilingual young children in this thesis show us that the LL can vary across settings, yet all settings had common elements when viewed through the PPCT model, discussed in more detail later in this chapter. The emergent bilingual young children in this thesis had diverse language repertoires and home language environments with exposure to minority languages that varied in quantity and complexity. The primary classroom studio was linguistically distinct to the home environment of the Chinese child who spoke Cantonese and had exposure to up to five languages within the home. The mainstream ECC was

mutually supportive and closely connected with the Māori child's home environment and caregivers incorporated the use of basic Māori language. The Samoan immersion ECC strongly supported the Samoan child's Samoan language development and encouraged use of Samoan language in their home environment. The majority language of each setting (English in mainstream and Samoan in immersion) was more visible than minority languages across the displays within the LL of the physical environments. The presence of other minority languages was observed in both the physical and virtual environments associated with all educational settings and was generally limited to multilingual greetings to welcome minority language speaking children and their families. The ECE centres had a higher number of displays inclusive of Māori language compared to the primary classroom studio. In all cases, the presence of Māori language in the LL aligned with the educators' descriptions of classroom practices and use of Māori language within the educational settings, which aimed to support the development of Māori language for both children and educators.

The displays that prompted and/or mediated minority language use directly with all children were more commonly observed in the ECE settings, with the term mediating suggesting a more bidirectional function of the LL. An artefact as a mediator was introduced in the Conceptual Framework chapter (see the Process-Person-Context-Time model section of Chapter Two). An example of the LL mediating the educator's use of minority language in ECE centres was a *Karakia* [prayer], a written prayer to read aloud before daily routines, such as eating (Figures 6b.14 and 6c.7). The LL as a mediator is illustrated in Figure 7.1 and shows the LL *Karakia* [prayer] artefact mediates the educators' (subject) Māori language use (object).

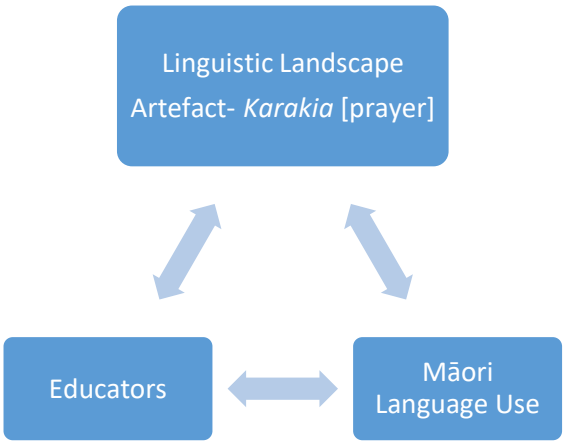


Figure 7.1: Based on the mediational triangle (Cole, 2005) the LL artefacts mediate the educators' use of minority language(s) within the educational settings of emergent bilingual young children.

All education settings supported play-based learning approaches, this approach enabled the development of relationships through interaction and play whilst embedding minority words through singing, reading and capturing children's learning experiences in learning stories. The positioning of Māori in these landscapes aligned with the positioning of minority languages within the national curriculum documents (see the Linguistic Landscapes of Educational Settings section in the discussion below).

The development of relationships with caregivers was a direct intention of the development in displays. Across both years of data collection, many displays directly communicated to caregivers, for example, noticeboards in ECC and signs on the windows in the primary classroom studio. In all educational settings, despite educator desire to engage caregivers in a partnership with the co-construction of the LL, there was limited evidence of co-construction in the first year of the research. Figure 7.2 shows an adaptation of the previous mediational triangle (Figure 7.1) to include the function of the LL to communicate to caregivers (bidirectional yellow arrows). Although some artefacts also mediate interactions with children, this is not shown in this Figure 7.2.

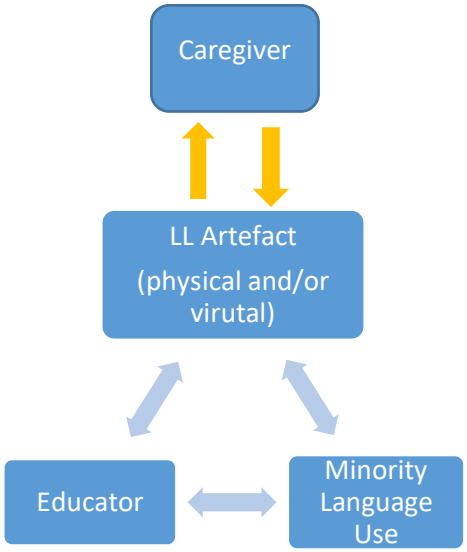


Figure 7.2: Based on the mediational triangle the LL artefact (physical and virtual) mediates caregiver and educator (mesosystem) proximal processes that vary in power, direction, content and form to support the use of minority languages.

Efforts by educators to capture the voices of family/whānau were observed with the LL, such as the mainstream ECC educators inviting caregivers to contribute their ideas to programme planning (Figure 6b.16) where caregivers were encouraged and supported to write on the display. This example

indicates the LL mediated bidirectional proximal processes with caregivers to mediate caregiver participation in programme planning. Other examples of caregiver participation in the educational programme were observed, with signs in the LL asking caregivers directly to contribute and participate, for example, signs asking for donations of fruit and to help with doing washing (Figure 6b.17). However, the absence of partnership in the co-construction of the LL in the first year indicated that the teachers retained power over the LL in ways that shaped the language values and ideologies within each setting. Overall, in all cases, the LL (physical and virtual) communicated the welcoming and valuing of minority languages and emergent bilingualism as a valued educational outcome.

The conceptualisation of contexts were "networked" (Figure 2.4) in this thesis, based on the conceptualisation offered by Neal and Neal (2013) as an alternative to the concentric circle interpretation (Figure 2.3) introduced in the Conceptual Framework chapter in this thesis. Adaptation of Neal and Neal's conceptualisation was by replacing Neal and Neal's mesosystemic interactions with proximal processes that can vary in power, direction, content and form. In addition, this adapted conceptualisation positions the educator and caregiver as key people to form associated networks for the developing child. In each case, the child had unique language networks through various educator and caregiver relationships that supported the presence and use of various languages. For example, caregiver Belle (mainstream primary classroom studio) used up to five different languages within the family network to various degrees. In contrast, caregiver Eve (Samoan immersion ECC) spoke with her children mostly in English despite her and her husband being Samoan speakers. In addition, both Belle and Eve were networked with language communities, which provided minority language exposure for their children. Each educational setting recorded children's home language in the enrolment process, however a classification of first, second or home language may not reflect the child's diverse language exposure nor their entire linguistic repertoire (resource characteristic).

Figure 7.3 builds on Neal and Neal's (2013) conceptualisation, and illustrates an example of the networked people through proximal processes that were common in each case. A child's minority language networks had the potential to support the presence and use of minority languages across the educational setting and home environment. Figure 7.3 identifies the proximal processes (depicted as bidirectional arrows) that network a child's family and additional cultural and/or linguistic networks that may support the presence and use of minority languages across the microsystems of their home environment and educational setting. These networks can include extended family, associates, friends, neighbours, educational support people and classroom peers. Each arrow in Figure 7.3 represents the proximal process that can vary in power, direction, content and form. Not included in

Figure 7.3 is the mediating LL (physical and virtual) or the element of time. This figure clarifies that, in the everyday lives of children, minority language networks enable children to engage in their minority languages across multiple contexts.

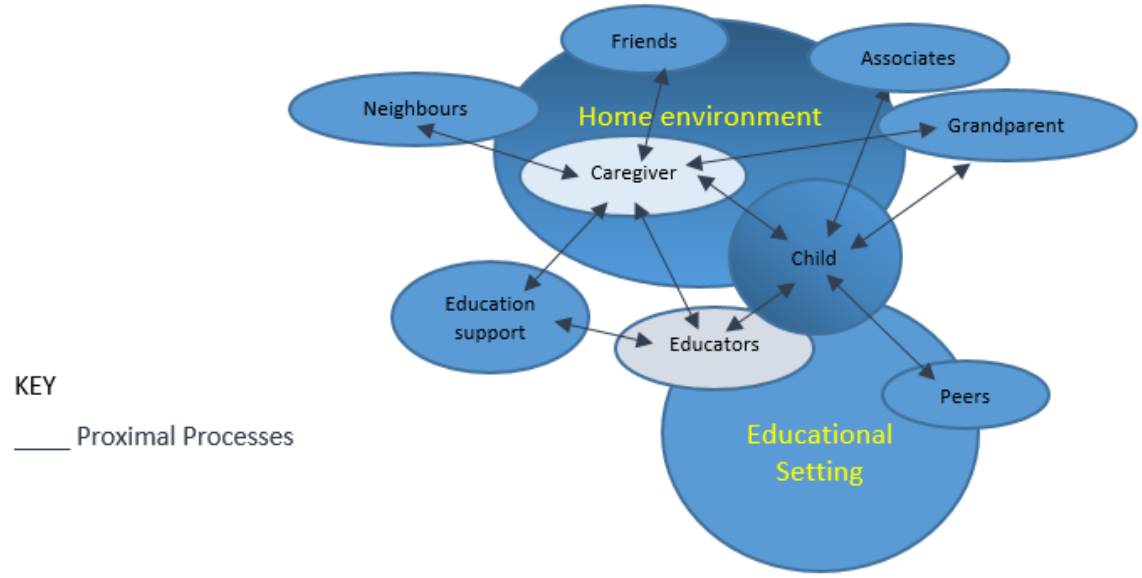


Figure 7.3: The conceptualisation of networked proximal processes through social relationships across contexts of the home environment and educational setting of emergent bilingual young child.

This network (Figure 7.3) includes the caregiver's associated networks that potentially have the minority language resources with whom the child could engage. For example, the Samoan child had opportunities to engage in Samoan with members of their family church, and the Chinese child had opportunities to engage in minority languages in a local Chinese retail area. Displays inclusive of children's families indicated a triadic approach that supported proximal processes across contexts and developed over time. The LL of educational settings can acknowledge and affirm children's minority language networks, thus strengthening pathways to further support the development of relationships and proximal processes inclusive of minority languages. Strengthening children's networks was observed within the LL of the educational settings in all three cases studies, with displays inclusive of children's families and inviting caregiver engagement, participation and belonging, thus strengthening the caregiver network. In the second year, the visibility of the child's family networks had increased with inclusion of children's family photos (for example, Figures 6a.19 and 6c.17). An example of a networking display was the "Our Whānau" display in the mainstream ECC emphasising the strength of connection with, and between, the attending families by describing their collective network as

whānau [family]. This strength of connection and identity also extended to the display of children with *Iwi* [tribe] affiliations, with a map inclusive of children's profile photos and a short *pepeha* [introduction] connecting children with their tribal lands and people (Figure 6b.6). In addition to the LL, the physical space of the mainstream ECC was designed to include space specifically for whānau. The teachers referred to this area as the "whānau corner", which had comfortable seating and information to support caregiver education. This concept of whānau was observed to explicitly include the diverse ethnicities and languages of the families attending the mainstream ECC in Figure 6b.20. However, despite the LL illustrating the child's networks, across all of the educational settings teachers were uncertain around parental expectation of minority language presence and use within the mainstream educational settings and whānau aspirations for bilingual language development. There was more certainty for children attending the Samoan immersion centre that aspirations included Samoan language development.

The *virtual linguistic landscape* (VLL) of the three educational settings of 4 to 6-year-old emergent bilingual young children in this thesis show the virtual environments associated with the educational settings were inclusive of minority languages. The VLL in each case networked microsystems of the educational setting and home environment to strengthen the mesosystem interactions between educators and caregivers. Relationships interconnect microsystems through proximal processes involving people, objects and symbols. In each case study, mapping children's networks enabled a more relevant positioning of DT as also networked, to understand how LL (physical and virtual) mediated interactions between systems (see Figure 6a.3, 6b.4 and 6c.3). Figure 7.4 illustrates the networked contexts with the inclusion of proximal processes (bidirectional arrows indicating the direction of power) mediated by the VLL within the virtual environment (blue circle). Proximal processes expanding beyond the virtual environment indicate those VLL platforms that were publicly accessible.

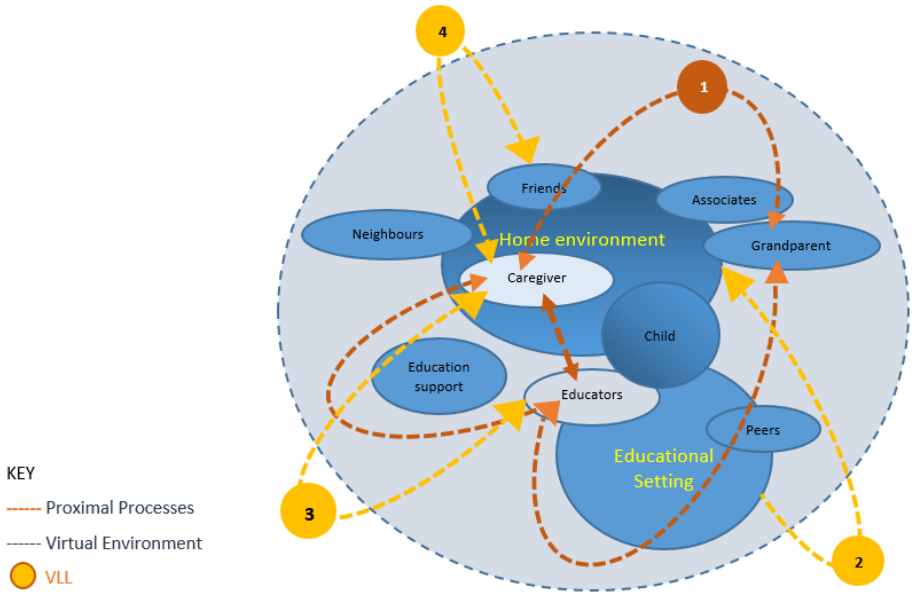


Figure 7.4: The Bioecological Systems Framework conceptualised as networked through proximal processes between people, objects and symbols (physical and virtual). KEY: 1. e-portfolio, 2. School website, 3. Facebook and 4. WeChat

Four artefacts were selected from the three case studies as illustrative examples in Figure 7.4. Example 1 was the e-portfolio (Figures 6a.23 and 6b.19) that could share children's learning experiences with caregivers and extended family. The e-portfolio allowed caregivers and extended family to share and contribute, thus enabling bidirectional proximal processes with the extended family network of the child. The e-portfolio was not publicly accessible and required a login and password to gain access. Example 2 was the school website, inclusive of minority languages (Figures 6a.1, 6a.11 and 6b.2) and publicly accessible, however proximal processes were not bidirectional as the content was controlled by the school for communicating information to people. Example 3 and 4 were social networking platforms Facebook (Figures 6c.20 and 6c.21) and WeChat that enabled bidirectional proximal processes inclusive of minority languages. Facebook was managed by the educational settings and used by educators, caregivers and their community networks. Belle used WeChat to communicate in her minority languages with friends in China. However, the illustrations from the case studies in this thesis indicated the VLLs experienced by young children remained relatively invisible to educators, and at times, invisible to caregivers within the home. In general, most adults lacked knowledge of what children were viewing and doing on DT. Teachers described children's DT use within the educational settings as being mostly in English. The LL of the home environments described by caregivers in all cases was limited to books and digital screen media, all of which included some degree of presence and use of minority languages. Despite the opportunity for digital screen media to enrich

the LL of the home environments, all caregivers expressed challenges and limitations with children's digital screen media use, this ranged from concerns of DT use displacing parent-child engagement to limitations on internet access and use.

The ethnic diversity of children attending the educational settings had increased after one year. For example, the Samoan immersion ECC had additional Māori, Pākehā/New Zealand European and Cook Island Māori children attending in 2017. The presence of minority languages in the educational settings also increased after one year. Each case study illustrated a degree of developmental change in the LL after approximately one year; this included the development of the VLL associated with the educational settings with the uptake of e-portfolio systems and inclusion of multiple languages on social networks. Māori language visibility in all educational settings increased in quantity and complexity over one year, while other less visible minority languages increased by a lesser extent. In all cases, the LL (physical and virtual) of educational settings had developed in both quantity and complexity of minority language presence and use over time. The primary classroom studio had a reduced number of English only displays and a new large multilingual display at the classroom studio entrance (Figure 6a.19). The mainstream ECC increased the presence of Māori (amount and complexity) in the LL. For example, evidence of the use of increasing complexity of Māori language was observed with more complex sentence structures positioned in the mat area of the centre that provided a prompt for adult use during whānau time (Figure 6b.22). The Samoan immersion had a reduced number of English only displays and increased presence of Samoan and multilingual greetings, which were positioned in more prominent locations, such as the entrance to the centre. Across all educational settings, the VLL continued to incorporate the use of minority languages and, in some ways, had expanded with the primary classroom studio introducing an e-portfolio system and inclusion of a Māori language app on the classroom iPads. The Samoan immersion centre had increasing engagement on the social media platform Facebook. The mainstream ECC had appeared to continue to have limited DT use directly with children and had sustained e-portfolio use with caregivers.

This thesis provides an original contribution to the field of LL research within educational settings, with the application of PPCT model and an original methodological approach. The PPCT model is a more recent interpretation of the ecological framework that deemphasizes a contextual approach and emphasizes proximal processes as the engines of development (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). The application of the PPCT model in this LL research shaped the development of the research questions, methodology, presentation of

case studies and the discussion of the findings in this thesis. The blended relational methodological approach incorporated photographic evidence, interviews and screenshots, and positioned the educators and caregivers as experts within their associated contexts. Positioning participants as experts aimed to expand shared understanding of the LL in educational settings and inform the development of theory and practice to empower educators and caregivers, who advocate for their emergent bilingual young children's minority language development. This thesis demonstrates the application of a conceptual framework can provide an ecological view that benefits research in multiple disciplines, which include socio-linguistics, education and child development. This ecological perspective of the world that each young child inhabits includes networked physical and virtual environments that evolve over time. In all three case studies this ecological view ensured the inclusion of emergent bilingual young children's minority languages in their physical and virtual environments in which their learning and development occurs.

The Linguistic Landscape of Educational Settings

Where do the LL of these three educational settings in Aotearoa New Zealand sit within the literature on LL? High visibility of minority languages within the LL tend to reflect strong language policies aimed to protect minority languages (Cenoz & Gorter, 2006). The influence of the national curriculum documents, considered as documents representing the macrosystem policies, was visible in all three educational settings. This influence of macrosystem policies and documents on the ECCs was more explicit than in the primary classroom studio. Teachers had created displays in the LL to reflect their interpretations of the policy documents and communicated learning outcomes to caregivers (for example, Figures 6b.3, 6c.1, 6c.11 and 6c.15). In contrast, the influence of the curriculum document in the primary classroom studio was more implicit with displays representative of the curriculum's emphasis on English literacy development and minimal visibility of minority languages. In the primary classroom studio, the presence and use of Māori language was basic, with single words, and multilingual greetings visible in the LL. Although Māori and Samoan language was more visible in the wider environment of the primary school's LL and VLL, this presence and use of Māori and Samoan language within the school appeared to position minority languages as external to the classroom studio. Educators confirmed that activities involving the use of Māori and Samoan occurred mostly outside of the classroom. In contrast, in both of the ECCs (mainstream and immersion), the presence

and use of Māori language reflected the Te Whāriki curriculum document, interwoven with the use of Māori words and design within the pages of the document. The title Te Whāriki itself translates to "woven mat". The two ECE centres both implemented the Te Whāriki curriculum and both had a higher presence of Māori language compared to the mainstream primary classroom studio, which was typical of the ECCs in the surrounding community (Harris et al., 2018a; Harris et al., 2018b).

The educational settings within this study ultimately held the power to decide how to manage linguistic resources, as the creators of their LLs. This aligns with Rojo and Reiter's (2010) review of LL studies across a broader range of institutional organisations, national and transnational; despite individuals being able to "mobilise" their linguistic resources, it was the institutions that ultimately held power of language resources. None of the educational settings had a specific language policy pertaining to development of emergent bilingual children's minority languages, nor policy on ensuring the visibility of minority languages within the LL of the educational settings. Tensions between monolingual ideologies and multilingual practices were evident in the mainstream educational settings, particularly for Lucia and Eve as caregivers of bilingual children in mainstream primary school education settings and their ability to mobilise their minority language(s) within the majority language educational setting. It appeared that the absence of a language policy in the microsystem might have mirrored the absence of macrosystem policy on language. New Zealand currently only has a policy guidance document developed by the Human Rights Commission (2008). Without an explicit local or national language policy, emergent bilingual young child growing up in Aotearoa New Zealand may be underserved.

This thesis positions the LL of educational settings as an effective mechanism to support the presence and use of minority languages as a means to support emergent bilingualism. In each case, the presence of minority languages within the LL (physical and virtual) aligned with the teachers' and caregivers' descriptions of minority language use within that educational setting of emergent bilingual young children. The LL was inclusive of each child's minority language(s) although there were varying degrees of visibility, diversity and complexity, with the degree of diversity of minority languages mostly aligned with the ethnic composition of the children within the educational setting. The displays in the physical LL often mediated the teachers' use of minority languages with children within the educational settings, this aligns with recent literature on LL research in educational settings (Cenoz & Gorter, 2008; Bever, 2012; Dagenais et al., 2009; Aladjem & Jou, 2016) and is further reinforced by the LL functions identified by Gorter (2018). Gorter (2018) identified five various functions of the LL in the educational setting, "the teaching of both subject content and language learning, the development of an

intercultural awareness, the teaching of values, and establishing behavioural rules, but also providing practical or commercial information" (Gorter, 2018, p. 81-82). These functions stemmed from the analysis of the communicative intentions of school signage and did not include teachers or students. Although the bidirectional nature of the communication intentions was not described within Gorter's functions, this does suggest the communication did extend to children and their caregivers, particularly for providing practical or commercial information. Examples of these LL functions were found in the three case studies, such as *waiata* [songs] and *karakia* [prayers] displayed in the educational settings used to mediate minority language use. Māori and Samoan song lyrics displayed within the mat area to support the educators' language use when singing with children in Māori or Samoan (Figures 6b.12, 6b.13, 6b.21 and 6c.8) functioned for the teaching of content and language learning as well as developing intercultural awareness. Teachers read the karakia [prayer] prior to daily routines (Figure 7.2). Both *waiata* [song] and *karakia* [prayer] observed in the LL mediated daily use of Māori within the educational setting and may have also functioned for the teaching of intercultural values and behaviours, serving multiple combined functions.

The publicly accessible VLL associated with the educational settings (Figures 6a.1, 6a.11, 6a.17, 6a.23, 6b.2, 6b.18, 6c.20 and 6c.21) was not observed to mediate interactions directly with children, unlike the physical LL. Despite the mainstream primary classroom studio having DT within the classroom for children to access, the VLL on these DT had limited Māori language content and no presence of other minority languages. The main use of DT within the mainstream primary classroom consisted of applications supporting children's English literacy and mathematics. The Samoan immersion ECC were enthusiastic about the uptake of DT use within the educational setting but had a number of economic and practical barriers to integrating DT into the classroom programme. This study found that interactions mediated by the VLL of the educational settings predominantly functioned as facilitating mesosystem proximal processes, these included the school website, e-portfolios and social media (Figure 7.4). Mesosystem interactions mediated by the VLL were inclusive of multilingual greetings (Figures 6a.1, 6b.2 and 6c.20). Additional minority language use, beyond greetings, was generally limited to Māori or Pasifika languages. Across all education settings, there were varying degrees of children using DT directly, with little or no evidence of the DT supporting the presence or use of minority languages. The implication of these findings is that the VLL may be underutilised within the educational settings of emergent bilingual young children with missed opportunities to enable direct and/or mediated involvement with their minority language in the VLL. Despite the perceived opportunities DT use could afford, educators took a cautious and/or protective approach. This is similar to Marsh et al. (2017) who found a common educator stance towards DT use within the

educational setting was “protective”. Teachers in ECC expressed interest in using DT more, but identified a need for professional development and additional teaching time to use the DT effectively with children in a purposeful way. Despite the potential for DT and the VLL to mediate and enhance the presence and use of minority languages (for example, Kirsch, 2018; Stille & Cummins, 2013 in the Literature Review chapter section schoolscapes and the VLL), there was limited visibility and understanding of the VLL of young children in these case studies. Therefore, it was not clear if the VLL of the educational settings was a supporter or disruptor of young children’s emergent bilingual language development. Two caregivers in this study had challenges with personal DT use distracting them from interactions with their children, emphasising a potential need for parental education around media use to create affordances for parent-child interaction that is enhancing, rather than distracting. This thesis found that the use of DT within the educational settings and home environments had both opportunities and challenges for emergent bilingual young children.

Even though there was less visibility of minority languages within the primary classroom studio compared to the ECCs, all teachers suggested they perceived language as a resource. In all educational settings, educators attributed the presence of minority languages within the LL to creating a welcoming climate for minority speaking families. This included building relationships, a sense of belonging, and engaging all caregivers in the learning programme, thus indicating that the teachers saw the value of minority languages within the educational setting. In all three cases, teachers either explicitly or implicitly identified that the main function of the LL is to develop relationships, which were viewed as fundamental to each child’s language development. The analysis of the three case studies show Gorter’s (2018) LL functions of schoolscapes (described earlier in this section of the Discussion chapter) appear to not include the development of relationships, much less the development of relationships with children’s caregivers, as a function of the LL in educational settings. Therefore, the discovery that the function of the LL is the development of relationships is an original discovery. The function of the LL to develop relationships aligns with bilingual language development literature that positions relationships as foundational for bilingual language development (King & Cunningham, 2017; Baydar et al., 2014). A possible reason for Gorter (2018) not including the development of relationships as a function of LL could be that Gorter’s study was set in primary and secondary schools. The educational settings in this study served much younger children compared to Gorter’s older children. It could be the physical presence of caregivers within the educational settings of 4 to 6-year-old children is more likely. Indications of the degree of physical presence of caregivers was observed in the LL of educational settings in the three case studies. The LL of the mainstream ECC appeared to cater for a higher physical presence of caregivers, for example, the whānau corner with

seating and information directly for caregivers was inside the centre (Figures 6b.3, 6b.5 and 6b.24). Whereas information directly intended for caregivers in the mainstream primary was observed on the windows facing out (Figure 6a.18). The function of the LL to mediate the development of relationships is an original contribution to current LL literature focussed on the educational context only and builds on Gorter's functions (2018) by including the perspective of the caregiver in the study of schoolscapes.

The LL of the educational settings in the three cases functioned to strengthen relationships, with artefacts designed to engage with caregivers and build children's sense of identity within the educational setting. The blended VLL shared the functions of the LL and aligned with the educators' interviews identifying a need to mediate and strengthen the educator and caregiver communication and relationships. Evidence of educators' positive dispositions towards inclusion were the extensive use of children's profile photos that was commonly observed in the three case studies and across educational settings in the wider study (Harris et al., 2018a), which indicates efforts to include all children. Shuker and Cherrington (2016) in their national survey of New Zealand ECE services also observed this sense of belonging through language and images to support linguistically diverse children. In addition, the use of minority languages in the educational settings reflected the educators' positive disposition towards inclusion. In all three educational settings there was a clear visible presence of the children attending the educational setting, through the use of children's profile photos, children's names and more personalised information in profile posters that were observed in the mainstream primary classroom studio (Figure 6a.4). The use of children's photos aimed to support the children's sense of belonging and inclusion and contributed to the function of the LL to develop relationships. Though some photos may indicate diversity, as can a child's name, the presence of profile photos and children's names do not factor in the overview of photographic evidence, as categorised by language visible, in the linguistic landscapes of the educational settings (see Figures 6a.5, 6a.12, 6b.10, 6b.19, 6c.5 and 6c.12). This highlights a possible limitation in current LL research methodologies that limit LL to visibility of languages and exclude the associated processes that were explored in this thesis, which may underlie and/or influence the development of relationships and children's emergent bilingualism.

Although teachers were not prompted to talk about theoretical understandings, none of the teachers participating in the research mentioned any link to the children's emergent bilingual language development and/or bilingual language development theory or pedagogy, such as the pedagogies that encourage translanguaging. However, educators' descriptions of language practices may have suggested an evolving theoretical and/or pedagogical understanding of bilingual language

development. Some educators, for example Maria from the mainstream primary classroom and Gus from the Samoan immersion ECC, attributed their professional development to participating in the LL research and professional development workshops on the theme of 'Emergent Bilinguals in a Digital World' Study Three (see Figure 1.3) that were offered by the project (Gillon et al., 2019). García et al. (2008) found that many inequalities in the educational settings of emergent bilingual young children (as introduced in the Literature Review chapter) stemmed from policy-makers and educators' limited understanding of the complex language practices of bilingual children. García et al. (2008) stressed the importance for educators and policy-makers to value such practices to develop children's linguistic repertoires. Macrosystem policies influenced the educators' decisions around the content of the displays, with curriculum documents displayed explicitly within the ECCs and more implicit influence in the primary classroom studio. The display of policy in the LL supports Brown's (2005) findings that educators as local policy "agents" have power over the interpretations and appropriation of language policy. Policy influences in the primary classroom studio were observed more indirectly, for example, the National Standards identified by Maria, the head teacher, as an external pressure for educators to develop children's English literacy skills. The emphasis on English literacy was visible in the LL of the primary classroom studio with English dominating the LL and many displays to support the instructional practices of the educators. This aligns with findings from the longitudinal study of young children who spoke languages other than English over the first five years of life in Australia (Verdon et al., 2014) where many of the minority language-speaking children begin to shift towards English by age five. This emphasis on majority language development when children transition to primary education has potential to support deficit discourses of children as English language learners' deficit in English, rather than support asset-orientated beliefs that value and give status to the language and community resources of emergent bilinguals. The educators' discourses and beliefs likely influence the networked processes (see Figure 7.3), with responsive reciprocal relationships able to counter deficit discourses (Harvey & Myint, 2014).

This research makes an original contribution to the study of LL in educational settings by incorporating the VLL into the LL and seeking out ways to observe it. The definition of LL of educational settings in this thesis builds on Brown's definition of schoolscapes as comprising of "the physical and social setting in which teaching and learning take place" (Brown, 2005, p. 79). This thesis adds the virtual setting as an additional or an extension of the networked LL of teaching and learning to Brown's schoolscape definition. Brown (2012) found the LL of educational settings tend to reflect the ideologies of the educators as LL constructors, through their interpretations of curriculum documents and positioning of minority languages. This study found this also applies to the VLL. In addition, the

findings from this thesis reinforce that the LL (physical and virtual) of the educational setting is a potentially powerful mechanism to mediate the development of relationships and linguistically responsive practices in order to value the development of emergent bilingual young children's entire linguistic repertoires. Development of a child's minority language(s) is a right (argued in the Introduction Chapter) that this is justified by the United Nations Convention of Children's Rights Articles 29c, Article 30 and Article 17d.

The Application of the PPCT Model in LL Research in Educational Settings

The novel use of the Bioecological Systems Framework, as a conceptual framework in the study of LL in educational settings, is an original contribution to the current LL research. The conceptual framework for this thesis, in particular, the *Process-Person-Context-Time* (PPCT) model (Bronfenbrenner, 2005; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2007), was outlined in Chapter Two and was selected as suitable for LL research in educational settings to provide an ecological perspective of child development. In this section of the discussion, the elements of the PPCT model and the interpretation of the findings from this thesis are discussed in the order of Person, Process, Context and Time. The PPCT model is a more recent interpretation of the Bioecological Systems Framework that prioritizes proximal processes over the contextual interpretation of the framework. Bronfenbrenner describes proximal processes as the "engines of development" (Bronfenbrenner and Ceci, 1994, p. 584; Bronfenbrenner and Morris, 1998, p. 996). Proximal processes are bidirectional interactions that occur with people, objects or symbols that vary in power, direction, content and form. The application of the PPCT model, along with selected artefacts, illustrated the proximal processes mediated by the LL of the educational setting (Figure 7.1), and development of educator/caregiver relationships (Figure 7.2), that networked with the home environment of the emergent bilingual young child (see Figure 7.3). An ecological perspective inclusive of the element of time, acknowledges that the ecologies of young children are changing.

Since internet access has expanded in schools, community facilities, and workplaces (Crothers et al., 2016), proximal processes occur not only in the physical space but can occur in physically and virtually blended environments. The VLL can interconnect across contexts, expanding relationships between diverse people and their communities. The networked conceptualisation of the Bioecological Systems Framework used in this study, based on Neal and Neal's (2013) perspective, enabled a more relevant

positioning of DT. Johnson and Puplampu (2008) validated an "ecological techno-subsystem" that bridged nested systems within the ecology, recognising that direct influence can occur via non-consecutive systems. The findings from this study demonstrate that the VLL of the educational settings was networked, mediating bidirectional proximal processes between teachers, caregivers and their communities. Schoolscapes are increasingly incorporating digital technology and virtual environments have an increasing role in shaping the ecologies of emergent bilingual children within their educational setting (Davis et al., 2019). Therefore, the use of the conceptual framework incorporating an "ecological techno-subsystem" (Puplampu, 2008) as networked in this thesis is an important and original contribution to the study of LL in educational settings.

Person

In the Bioecological Systems Framework, Bronfenbrenner and Morris (1998) incorporated the biological person into the framework by including the 'characteristics of the developing person' (see the Person section of Chapter Two). These characteristics are defined as *demand*, *resource*, and *force* characteristics and are as influential on the environment as the environment is on the developing person. The demand and resource characteristics of the educators, caregivers and children were identified in each case as influential, or in some cases limiting, on the presence and use of minority languages within the educational settings. The majority of the educators interviewed attributed a main limitation on the presence and use of minority languages within the LL of educational settings to the educator's minority language skills (resource characteristic), both within the mainstream and immersion educational settings. The mainstream teachers indicated that they were all English monolingual speakers. A number of teachers said this presented a degree of limitation on their capacity to support the presence and use of minority languages within the educational setting. This suggests to some extent that the educator's perception was that the presence and use of minority languages was therefore limited to their personal minority language resources and capabilities. This has a number of implications for the LL of emergent bilingual young children. Firstly, that the presence and use of minority languages are dependent on educator's resource characteristics and secondly, that the pedagogical approaches towards supporting children's minority language development are teacher centred. This interpretation therefore implies dependence on the personal motivation (force characteristic) of educators to acquire words or phrases in order to use them daily within the classroom for minority language development.

However, all educators as monolingual speakers had avenues for accessing minority language resources to enhance the LL and VLL of the educational settings. One avenue taken by educators within the Samoan immersion settings was to access English resources online and adapt the resources by adding Samoan language, as the quantity of Samoan language resources available were limited. In the mainstream ECC, there was evidence of educators modifying displays to incorporate minority languages (Figure 6b.21) with handwritten translations added to existing English publications or material accessed online. The evidence of educators' modifications indicated educators' effort and intention to incorporate minority languages. The presence and use of Māori language in the educational settings, particularly the basic single word use in the primary classroom studio, is similar to the presence of Māori words in the New Zealand English lexicon, which has been steadily growing (Macalister, 2006). However, the presence and use of Māori within the ECE centres was much richer with the use of more complex language. This similarity between the primary classroom studio and the New Zealand English lexicon points to macrosystem influence on monolingual teachers' Māori language abilities and highlights the role Māori language use within the macrosystem has in developing the resource characteristics of educators. The incorporation of common Māori terms was somewhat normalised within the LL of all three educational settings with use of Māori language to refer to regular objects or routines within the educational settings, for example, families as *whānau* (Figures 6b.16 and 6b.20) and conversations as *kōrero* (Figure 6a.11). These common terms appeared in the LL and VLL without translation. The teachers' interpretations of their perceived limitations of minority language use within the mainstream educational settings was similar to Brown's findings (2005), in that Võro language in the LL of the school environments was dependent on the educator's efforts to include Võro language. In all three cases in this thesis, the educators were making the effort to ensure Māori language visibility within the educational setting, and multilingual greetings in the minority language(s) of children attending. In two of the case studies, caregivers Belle (Chinese child's caregiver) and Eve (Samoan child's caregiver) considered themselves to be wholly responsible for the intergenerational transmission of their minority language as their children progress through the educational system, particularly when transitioning to primary school where Eve observed less visibility of Samoan language and culture. However, research shows that systematic and extensive exposure to a child's minority language(s) across contexts is important for their bilingual language development (Petitto & Dunbar, 2004). In addition, proximal processes that underlie development and connect networks are bidirectional (see for example, Gámez et al., 2019; Romeo et al., 2018; Rydland et al., 2014). Given the presence and use of minority languages in the LL of educational settings was dependent on the educators' minority language resources, as discussed in the previous section, the extent to which young children could mobilise their linguistic repertoires in these cases

was more limited than it need have been. As it is likely most caregivers have the language resources, the strengthening of relationships between educators and caregivers could enable bidirectional interactions to enable a collaborative approach toward the LL construction so minority language resources support the development of young children's LL in educational settings.

Personalised representation of children's linguistic repertories was not observed beyond the representation of children's ethnicities. The implication of this is that absence of presentation of children's languages as an integrative system and resource characteristic, fails to acknowledge how emergent bilinguals use their languages and thus better support translanguaging perspectives and pedagogies. A potential consideration for building an understanding of children's linguistic repertoires and therefore building on understanding the *what* by adding the *how* to the enrolment procedure to support more responsivity to the child's development of languages. All three educational settings recorded children's home language(s) at enrolment, but this was not inclusive of children's additional minority language networks. Slavkov (2018) recommends that language profiling of children should not be bounded by the L1 and L2 classification. This bounding of classification was observed within some displays of the educational settings with multilingual greetings often associated with ethnic identity or country of origin, as observed in multilingual displays that were inclusive of national flags (Figure 6a.19). This may suggest that educators in each case may adopt an oversimplified perspective to classification that may not reflect the current understanding of how emergent bilinguals use their languages through translanguaging (for example, Creese & Blackledge, 2010; Fielding, 2016; García & Li, 2014; Jonsson, 2013; Wei, 2018). Understanding bilingual children use their languages by drawing on their linguistic repertoires may better inform educators to develop the LL so that it mediates such mobilisation of children's entire linguistic resources.

The person characteristic discussed in this section identifies the minority language as a resource characteristic of each person in the ecosystem. In this thesis, the resource characteristic (or lack of) was influential on development of the LL of educational settings. The force characteristic referred to the educator's motivation to include minority language, observed in the linguistic landscapes as the educator's intentional modifications to add minority languages. The inclusion of minority languages in the LL somewhat reflected the use of Māori language in the New Zealand lexicon, indicating macrosystem influence on educators' resource and force characteristics. Given the limitations identified in the resource and force characteristics of the three case studies, it further supports the position that the development of relationships with caregivers is necessary, as caregivers are likely to be the people with minority language resource characteristics. The discussion now turns to proximal

processes to illustrate the empowerment of caregivers within the bidirectional interactions that can enrich the LL (physical and virtual) of emergent bilingual young children through collaborative relationships.

Proximal Processes and the Empowerment of Caregivers

Proximal processes are the key element of child development in the Bioecological Systems Framework and are defined as interactions that occur with people, objects or symbols (Bronfenbrenner & Morris, 1998). As stated in the Conceptual Framework chapter, Bronfenbrenner defined process by the power, direction, content and form of the proximal process. In each case, the LL had artefacts that served to mediate proximal processes for the development of relationships by directly communicating to caregivers and/or inviting caregiver engagement, such as conversational interactions particularly between caregivers and educators that enabled bidirectional proximal processes between educators and caregivers. Cath, the head teacher of the mainstream ECC, indicated a primary aim of the LL in 2016 was to communicate to caregivers. She stated, "The linguistic landscape is meaningful and at a level that parents will understand what the centre is trying to communicate". Caregivers have reduced ability to provide minority language exposure once children enter majority language educational settings (Makarova et al., 2019) and that reduced caregiver involvement may compromise children's bilingual language development. Research on the transmission of minority languages indicates that the family plays a critical role in children's bilingual language development (Baydar et al., 2014; King & Cunningham, 2017), which includes caregiver's attitudes and beliefs that influence their day-to-day language choices and use (King & Fogle, 2006; Lee & Kim, 2011; Worthy & Rodríguez-Galindo, 2006).

In all three cases, the LL and VLL mediated proximal processes that varied in power. This power influenced the degree of reciprocity within the educator and caregiver relationship, such as the degree to which the caregiver could contribute their minority language(s) to the educational setting. The power and direction of the proximal process was dependent on the purpose, design and form of each artefact, with the VLL mediating more bidirectional proximal processes. Reyes, Da Silva Iddings and Feller (2016) found responsive and reciprocal relationships enabled educators to counter deficit discourses and respond to children's linguistic diversity by giving minority languages status and value in the educational setting. This was illustrated in Figure 7.2, which shows LL artefacts mediate proximal processes based on the educator and caregiver relationship that can enhance the presence and use of minority languages within the LL of educational settings, particularly with bidirectional

communication and power balanced between the educator(s) and caregiver(s). Each arrow in the figure represents the directional nature of proximal processes mediated by the LL that support the use of minority languages with the child in the educational setting. Caregiver participation within the learning programme of the educational settings in each case was dependent on the degree of empowerment caregivers experienced and if they could mobilise their own minority language resources in physical and virtual environments.

In the three educational settings, some displays were very considered and took time to develop in linguistic complexity. The mainstream ECC teachers intentionally minimised the visual chaos in the LL to ensure the development displays were well considered with minimal use of colours and plastics by favouring the use of natural materials to reduce visual chaos as a disruptor. Bronfenbrenner and Evans (2000) defined chaos as systems "characterised by frenetic activity, lack of structure, unpredictability in everyday activities, and high levels of ambient stimulation. When background stimulation is high, and there is a general lack of routinization and structure in daily life. The environment is also a major source of interruption of proximal processes in the form of residential noise, crowding, and classroom design (e.g., open vs. traditional classrooms)" (Bronfenbrenner and Evans, 2000, p. 121). Therefore, displays within the LL can be minimal and effective.

The constructors of the artefacts or displays within the physical LL of the educational settings indicated that the educators held the power over the creation and management of the display with a few instances inviting caregiver collaboration (Figure 6b.16). In two of the three case studies, caregivers Belle (mainstream primary classroom studio) and Eve (Samoan immersion ECC) both had minority language resources. However, there was little evidence in the LL of the educational settings that they were empowered to collaborate with educators in the construction of the LL, in order to support the use of minority languages within and beyond the educational setting. Power over the LL extended to the educators' power over DT and how it was used within the educational settings. The educational settings used DT to various degrees, with the Samoan immersion ECC having limited DT, the mainstream ECE intentionally limiting DT, and the primary having more available DT for children to use when controlled by the educators so that it was used only for what was deemed "educational value", although educators were not explicit about what that meant. Children's use of DT within the primary school was mostly literacy-based activities. In 2018, the iPads had some Māori apps for children to use which indicated that the LL of DT had developed from English only apps in 2017. There was no indication from the teachers interviewed that the DT was used in ways to mobilise children's

linguistic repertoires to facilitate translanguaging pedagogies (for an example of translanguaging pedagogies with DT see Kirsch, 2018).

Digital platforms in all three cases, such as email, e-portfolios and social media, became important VLLs that mediated bidirectional proximal processes between educators and caregivers that network the educational and home microsystems. This is similar to Beaumont-Bates (2017) finding that the e-portfolio had the capacity to increase educators' knowledge of the home environment, although Beaumont-Bates (2017) did not explicitly state if this responsiveness was inclusive of children's minority language development. E-portfolio platforms used in two of the case studies, SeeSaw (mainstream primary classroom studio) and Educa (mainstream ECC), engaged caregivers in children's learning and enabled bidirectional communication; however, neither Ange nor Cath had observed a caregiver incorporate minority languages. The e-portfolio platforms, therefore, have potential to mediate proximal processes with bidirectional communications and empower caregivers and educators to include a child's minority language(s). Proximal processes mediated by DT within the classroom seemed to be unchanged over the two years, with no intentional use to support children's development of minority languages identified in the teachers' interviews. However, it took time for additional proximal process to evolve in the VLL and the use of e-portfolio in both educational settings appeared to be in an early stage of evolution. The design of digital platforms supported the potential to increase parental agency, creating a third space. However, perhaps due to the limitations on data collection of the virtual environments in this thesis, there was no evidence of bidirectional interactions obtained from any e-portfolio. Examples in other educational settings in the larger study were observed using the VLL to support parental agency and minority language use with one parent uploading a video of their child singing *waiata* [song in Māori] while on holiday that was shared with the ECC community via the e-portfolio (Davis et al., 2019). The Samoan immersion setting did not have an e-portfolio and their preference was to use a free social media platform. Screenshots from the Samoan immersion ECC's Facebook page suggested that the social media platform had enabled bidirectional interactions inclusive of minority languages. For both of the mainstream educational settings, there seemed to be limitations with the incorporation of minority languages into the LL and/or VLLs. LL research inclusive of such social media platforms has shown the capacity of Facebook to network multilingual practices with older students using Facebook (Androutsopoulos, 2015). However, there is currently a gap in the literature of research that includes both the physical and virtual LL associated with educational settings, to understand if those platforms empower minority language speakers to contribute to enriching such landscapes.

Dressler (2015) recommended sign makers explicitly target the promotion of bilingualism with the inclusion of students as creators of bilingual signage by drawing on their linguistic resources. However, children in these case studies did not directly access the VLL associated with the educational setting. Rather than directly involving students as creators, there was evidence of the LL drawing on their linguistic resources through capturing children's voices but in the physical LL, this was limited. Overall, there was evidence of educator power over the LL and children's voices were represented in the LL with learning stories and photo captions (Figures 6a.14 and 6a.15). In mainstream settings the children's voices were represented in English only, while in the Samoan setting the children's voices were represented in Samoan (Figures 6c.13 and 6c.18) and observable in videos posted on Facebook (Figure 6c.21). Many of the displays were generated from content created by the children in the classroom and curated for display by the teachers. (Figures 6a.13, 6a.14 and 6a.15). The VLL appeared to better represent children's voices through the use of video, with examples of children using Samoan in the primary classroom studio (Figures 6a.17) and the children singing a Tongan song (Figure 6c.21). These videos were shared on platforms that could be accessed and viewed by the public. These are examples of the bidirectional proximal processes mediated by the VLL, referred to earlier, that may empower caregivers to use a child's minority language(s) across settings. However, it was unlikely that any proximal processes in any of these case studies enabled bidirectional interactions whereby children were able to mobilise their entire linguistic repertoires; this would have required providing translanguaging opportunities within adult-child or child-peer dyads, which have been found to be associated with bilingual language development by Gámez et al. (2019) and Rydland et al. (2014).

The educational setting is a potential power institution to influence minority language attitudes and beliefs, and thus presence and use of minority language within the family (Baker, 2019; Spolsky, 2012). This is important given that familial attitudes and beliefs influence the day-to-day use of language choices (King & Fogle, 2006; Lee & Kim, 2011; Worthy & Rodríguez-Galindo, 2006). However, in a study of ECCs in Aotearoa New Zealand Chan and Ritchie (2016) found that despite Te Whariki (Ministry of Education, 2017) acknowledging that learning development is fostered when a families' culture and practices are recognised, minority families in their study had experienced institutional disempowerment. The LL of the Samoan immersion setting indicated a strong language ideology and leadership model designed to empower educators, children and families to use Samoan language. This was similar to the Māori immersion ECC setting associated to the wider project (Harris, 2017). Proximal processes described by teachers in the Samoan immersion ECC indicated their intentions were to empower the presence and use of Samoan within the home environment. The Samoan immersion centre appeared to be more welcoming of additional minority languages, with explicit intentions to

employ linguistically diverse staff. The immersion setting provided a rich language environment for Samoan language use and development; teachers expressed the importance that this was reinforced within the home environment as well. This highlighted the centre's awareness of the need to expand children's Samoan language exposure parameters, such as across multiple microsystems. Lee et al.'s (2015) study of Spanish-speaking parents and teachers of 3 to 7-year-old emergent bilinguals on parental beliefs, influences and strategies for supporting bilingual language development found that few educators and caregivers of emergent bilingual children know how to collaborate with each other without caregivers being physically present in the classroom.

The findings from the three case studies illustrate ways in which the physical LL and VLL can be a tool for collaboration and enabling home and school interconnectivity. In particular ECE e-portfolio systems and the use of social media did increase presence and use of Māori and Samoan language in the home settings, with parent Eve stating that her only exposure to Samoan language through DT was interacting with the immersion ECC's Facebook page. However, educator power over constructing the VLL associated with the educational setting varied, for example, the mainstream primary classroom studio and mainstream ECC were set within larger hierarchical systems. Mainstream educators were required to follow a formal system process to post content on the VLL. The limitations on educators' ability to construct the VLL directly may possibly disrupt the strengthening of authentic and bidirectional connections between the home and educational setting. Whereas the centre managers of the Samoan immersion ECC controlled the VLL, but were limited within the powers held by the online platform providers, such as Facebook. These hierarchies of power were possibly intended to protect the associated community members. Concern of protection was observed in the mainstream ECC with guidelines around safety and use of DT at the organisational level. Therefore, the whole hierarchy may need to become aware of the role that the VLL can play for emergent bilinguals.

The discussion now turns to the conceptualisation of proximal processes as networked, to illustrate how these networks support the presence and use of minority languages within the educational setting of young emergent bilingual children.

Networking and Networking of Contexts

Proximal processes network a child's family and additional cultural and/or linguistic contexts and microsystems (Figure 7.3). Networked people and systems provided a triadic approach that developed over time to support the presence and use of minority languages across contexts. The networked conceptualisation considers all microsystems as meso by nature with proximal processes stretched beyond the physical boundaries of each environment. The mesosystem of interest in this thesis is defined as the interactions between the caregivers and educators of emergent bilingual 4 to 6-year-olds. The analysis of the three case studies indicated that educational settings would benefit from being more strongly networked with caregivers and their associated minority language networks in order to support the presence and use of minority languages within the educational setting and beyond. Bronfenbrenner (2009) suggested a triadic approach because the presence and participation of an additional person was crucially essential for the developmental process. Additional people and networked contexts provide more opportunities for conversational interactions and "the capacity of the setting to function effectively as a context for development" (Bronfenbrenner, 2009, p. 6).

The mainstream primary school educators appeared to have more uncertainty about caregivers' perceptions about bilingualism compared to the ECCs. Maria, the mainstream primary classroom studio lead teacher, suggested that despite children having minority language resources, "the perception from home is when you are at school you speak English." However, from Maria's comment it is not clear if the use of English only within the educational setting was a whānau aspiration or the parents' acceptance of English as a majority language. Both the educators and caregivers, particularly in the mainstream primary classroom studio, viewed the home environment and the educational setting as distinct microsystems, potentially isolating minority and majority language use to the individual microsystems. This mirrors opposing findings in the literature, which may be related to a lack of shared ideology that may be linked with the lack of LL policy discussed earlier. Verdon et al. (2014) found some educators followed the desire of parents to emphasise English within the educational settings, whereas other literature found that parents perceive bilingualism as a resource (King & Fogle, 2006; Lee & Kim, 2011; Worthy & Rodríguez-Galindo, 2006). The latter indicates that parents would support sustained minority language development across microsystems. This highlights that, even with the efforts to network microsystems, there was a lack of shared ideologies around the power of minority languages across microsystems.

The triadic principle, proposed by Bronfenbrenner (Bronfenbrenner, 2009), applied to the microsystems enabled systematic and extensive exposure across multiple microsystems in order to expand the perimeters for minority language presence and use. Figure 7.4 illustrated the networked microsystems interconnected through proximal processes between people, objects and symbols (physical and virtual) that provide a triadic approach to their microsystems. For example, the microsystems of the church, library, community and extended family were attributed to supporting minority language practices in each case study and increased the number of environments in which the child could mobilise their linguistic repertoires. Petitto and Dunbar (2004) stated "extensive and systematic exposure" across multiple contexts could enable children's bilingual language development for young children not exposed to dual languages from birth. Exposure to minority languages across contexts may counter the challenges minority language speaking families have in maintaining natural intergenerational transmission within the home environment (Fishman, 1970). The function of the LL and VLL in the case studies to connect with whānau and community networks were additional means for supporting the presence and use of minority languages in ways that enabled bidirectional interactions across multiple microsystems of the emergent bilingual young child.

These findings confirm existing sociolinguistic literature that the LL is a mechanism to influence how languages are perceived and used (Cenoz & Gorter, 2006; Danesi, 2018), and that the LL reflects language policy and practices (Cenoz & Gorter 2006; Gorter, 2013; Shohamy & Gorter, 2008). All home environments in this study had access to DT, which indicated that they could access virtual content inclusive of minority languages suggesting that the LL of the home environment extended beyond the physical boundaries of the home (see Figure 7.4). This includes quality DT engagement that is bidirectional and empowers the child to mobilise their funds of knowledge (schema) in ways that are visible and can transfer to their physical worlds. The access to DT and the VLL included applications that could enable socially contingent interactions, such as those that expand the social networks of minority language speakers to support the presence and use of minority languages in the LL of the home environment. Proximal processes network a child's contexts through bidirectional interactions. Bidirectional interactions may support the presence and use of minority languages across a child's contexts and this includes their virtual environments. The LL of the educational settings studied benefited from being more strongly networked with emergent bilingual young children's families and communities (for example, Figures 6a.20, 6b.20 and 6c.20). The presence of children's networks in the LL validates and affirms pathways that enable bidirectional proximal processes that support the presence and use of minority languages in the LL (physical and virtual) of the educational settings and beyond. Systematic and extensive exposure of minority languages across contexts supports bilingual

language development (Petitto & Dunbar, 2004). However, the LL (physical and virtual) of educational settings has been limited to the physical LL educational setting (see for example, Brown, 2005; Brown, 2018; Biró, 2016; Dressler, 2015; Laihonen & Tódor, 2017; Pakarinen and Björklund, 2018; Szabó, 2015) and not recognised as mediating networking and networking of contexts as illustrated in this thesis.

This discussion now moves to the final element of the PPCT model, Time, to discuss the methodological approach to LL research that enables the development of the LL (physical and virtual) over time.

Time

A more recent addition to the Bioecological Systems Framework (Bronfenbrenner, 2001) has been the element of time, referred to as the *chronosystem,* which represents the effect of time across all systems. Bronfenbrenner further divided chronosystem into micro, meso and macro-time. The element of time identified in the LL of educational settings in this thesis was the meso-time, given that there was approximately one year between the observations of these three LL. In terms of Bronfenbrenner's Proposition One of proximal processes (detailed in Chapter Two), the nature of the interactions needs to be reciprocal and increasing in complexity over time. This increasing complexity was observed in the LL and VLL associated with the educational settings that mediated proximal processes. In addition, there was increased complexity in how the DT networked people and their microsystems. This was observed in a number of examples such as the introduction of additional virtual platforms, which included the e-portfolio introduced in the mainstream primary classroom studio (Figure 6a.23) and the increasing community engagement and views of posts on the Samoan immersion centre Facebook page (Figures 6c.20 and 6c.21). The expanding nature of the VLL associated with the educational settings in the three case studies aligns with Shohamy's (2015) view that nature of the LL is expanding and evolving particularly the VLL. Biró (2018) described the VLL as transitory, dynamic with delocalised speakers and distinct from the nature of the LL. The findings in this thesis show the VLL of educational settings was a developing element of the LL of educational settings, so that it deserves equivalent consideration in LL research as part (or as an extension) of an educational environment of the schoolscape.

The development of the LL (physical and virtual) over time is now discussed in terms of a networked conceptualisation using the example Artefact 1 “Where in the world do I come from?” (Figure 6a.19). This artefact was a particularly substantial development in the mainstream primary classroom studio LL and was counted as one multilingual display in the LL in 2018 (see Figure 6a. 12). In 2017, the primary classroom studio had no displays in the physical LL that represented languages other than English and Māori. Figure 7.5 illustrates the expanded mediational triangle that includes the LL (physical and/or virtual) mediating the development of relationship proximal processes with children’s caregivers and peers to support the presence and use of minority languages with children in the educational setting. The darker blue arrow indicates the potential to empower caregivers to collaborate in the construction of the LL of educational settings in ways that are inclusive of their minority languages. This expanded mediational triangle is a particularly notable finding of this thesis. It aligns with children’s rights to their languages and Treaty of Waitangi responsibilities, such as those that underpin Te Whāriki Early Childhood Curriculum principles that influenced the development of relationships and complexity of the deployment of minority languages as the LL evolved over time.

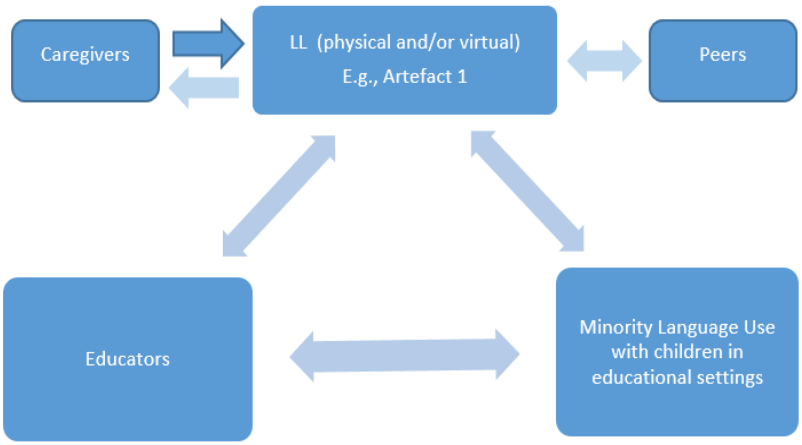


Figure 7.5: An expanded mediational triangle illustrating the LL (physical and virtual) mediating the educators’ use of minority languages inclusive of Caregivers and Peers bidirectional interaction. The construction of Artefact 1 “Where in the world am I from?” (Figure 6a.19) was a development from the profile display template (Figure 6a.4), designed by the teachers and observed in 2017 and 2018. The construction of Artefact 1 required development of relationships and empowered caregiver input with caregivers contributing photos of children and their families to the display of maps, national flags and multilingual greetings. Artefact 1 was a prominent and visible display and it was observed to mediate daily interaction between teachers, caregivers, the VLL, and children and their peers, including other children with similar ethnic identities and languages stimulating peer-to-peer interaction. The arrow from the caregivers to Artefact 1 is stronger than its return because they contributed the material for their children.

The multilingual display in 2018 was co-constructed with caregivers contributing photos of children and their families for display to connect with multilingual greetings, and national flags to locations on a map. The development of the display aligned with classroom practices of incorporating multilingual greetings, through the roll call and singing, into the daily classroom practices, which was then supported with a multilingual greetings song the teachers played using YouTube accessed through DT in the classroom studio. Further detail is provided in that case study in Chapter 6a. Similar types of displays were observed in the other educational settings within this thesis and in educational settings in the surrounding community (Davis et al., 2019; Harris, et al. 2018a; Harris et al., 2018b).

The proximal processes mediated by the LL became more networked after one year, occurring between people associated with the home environment, the educational setting and the virtual environment to support the presence and use of minority languages within the educational setting. The visibility of minority languages had developed in complexity over the year so that the LL not only became representative of what languages emergent bilingual young children were developing, but also developed to include *how* and *with whom* their languages were developing. Artefact 1 mediated the development of relationships and bidirectional proximal processes that included children's caregivers and peers. Educators' accounts of children speaking in shared minority languages with their peers indicates the LL can mediate the development of relationships between minority language speaking children in order to mobilise their minority languages within the educational settings. Mediation of the development of relationships was achieved by Artefact 1 enabling children to make connections with the ethnic identities and languages of other children and their families, to locations on a map or the world and a map of Aotearoa New Zealand. The map display was positioned in the classroom studio so that it was visible to other children within the school, as well as visiting family members. Peer conversations are a valuable contributor to bilingual language development, in both complexity and diversity (Rydland et al., 2014; Gámez et al., 2019). Thus, Artefact 1 functioned to stimulate and mediate additional sources of minority language input for emergent bilingual young children within the educational settings. In addition, the Artefact 1 strengthened the educators' understanding of emergent bilingual young children's language contexts and networks. In the previous year, general terminology associated to defining children's ethnic identities was used, such as Asian or Pacific Islander. Whereas Artefact 1 appeared to have enabled the recognition of more detailed ethnic identity and the country of origin of each child's family. Thus, the educators had been able to develop more in-depth knowledge about children and their linguistic and ethnic identities, because it had mediated conversations between educators, caregivers, children and their families.

In all three cases, many elements within each of the educational settings of LL remained relatively unchanged. Examples of unchanged elements were the furniture layout of the centre space and location of significant displays (for example, Figures 6a.2 and 6a.9), displays that provided a functional role, for example, notice boards (Figures 6b.8, 6b.15 and 6b.26) and instructional displays (Figures 6a.6 and 6a.8). Elements on website pages associated with the educational settings also remained relatively unchanged. A positive perspective on the LL remaining relatively unchanged is that the environment provides predictability and stability (Doolittle, 2014). However, the lack of change raises the question about the extent to which the LL landscape can respond to the changing centre community. In the immersion centre the change was more visible including an increase in Samoan language visible in the LL (Figure 6c.12), and many areas of the classroom labelled with Samoan language signs and development of a new management system (Figure 6c.14), and a clearer positioning of Samoan language in the bicultural context of New Zealand. As presented in Chapter 6c section 6c.4, this larger change in the Samoan immersion ECC had been partly prompted by an Education Review Office (ERO) visit.

The nature of the relational methodological approach (see Methodology chapter) led to the occurrence of proximal processes between the researcher and the researched, and the bidirectional nature of these proximal processes was likely to have led to a small researcher influence on the LL development. This influence was clear in the primary classroom studio in Maria's response to the LL report that I had written and sent to her prior to my return after approximately one year. Maria in her interview said that, after reading the year 1 report, she had identified there was more the educators could do to develop their LL. This has also been observed in other research. With the application of the element of time, Brown found "engines of change" behind the development of the schoolscape; these engines of change included the educator's commitment to professional development and pedagogical knowledge on immersion language-instruction. The educators' commitment to professional development was observed in our larger project with educators engaging in professional development workshops on the theme of 'Emergent Bilinguals in a Digital World' Study Three that were offered by the project (Gillon et al., 2019). Educators also engaged in other offerings of professional development and adopted resources from community networks supporting the presence and use of minority languages within the educational settings of emergent bilingual young children in Aotearoa New Zealand designed to strengthen educators' interpretations of national curriculum documents.

The case studies in this thesis demonstrate that the LL of educational settings can develop over time to increase the presence and use of minority languages within the educational settings and there is value in applying the element of time to LL research. Although LL research theory and methods developed at a time (2013) when DT was not so extensively used, Gorter (2013) noted that rapid uptake of DT presented an opportunity and challenge for LL researchers. Gorter (2013) also emphasised that as "language becomes increasingly digitized" (p. 205) the LL expands, therefore, replicable methodologies are an important direction for future LL research. This thesis has provided a conceptual framework and methods that begin to address the opportunities and challenges faced with incorporating the VLL in the LL research. However, despite the inclusion of the element of time in Brown's (2018) revisit to the original schoolscapes in 2013 to 2014, the LL methods used were still not inclusive of the VLL of the educational settings. The lack of inclusion of the VLL in more recent schoolscape research indicates a lack of methodological development that is necessary to enable incorporation of the growing VLL associated with educational settings. Research exploring children's everyday uses of DT (see for example, Plowman, 2015) indicates a range of methodological challenges in capturing children's VLL that are exacerbated with rapid technological changes. Plowman (2016) suggests a reconceptualization of context, "now that the boundaries between 'home' and 'technology' are less distinct than they were just a few years ago" (p. 190). This indicates that there may be future methodological benefits from this thesis when LL are reconceptualised as networked contexts which may open up more methodological approaches to capturing the LL (physical and virtual) of emergent bilingual young children.

Conclusion

This chapter has discussed, with citations of relevant literature, the application of the Bioecological System Framework and the PPCT model to the LL of educational settings of emergent bilingual young children. The three case studies showed the LL (physical and virtual) could mediate in the presence and use of minority languages (Figure 7.1). The three case studies also provided evidence the LL (physical and virtual) mediated the development of relationships with caregivers that empowered caregivers in bidirectional proximal processes that enriched the LL (physical and virtual) for the emergent bilingual child (Figure7.2). The conceptualisation of children's networked contexts (Figure 7.3) identified the interconnection through proximal processes between people and their LL and VLL (Figure 7.4). The LL and the networking of children's contexts developed over time (Figure 7.5) to

increase support of the presence and use of minority languages across contexts. The following chapter presents the conclusions and recommendations arising out of this discussion.

8. Conclusion and Recommendations

This thesis has illustrated the LLs (physical and virtual) of emergent bilingual 4 to 6-year-olds growing up in Aotearoa New Zealand, viewed through the Bioecological Systems Framework that prioritised processes with people between contexts and over time with the *Process-Person-Context-Time* (PPCT) model. Understanding the proximal processes associated with the LL of educational settings for the first time in LL research aims to inform LL design as an effective mechanism to support the presence and use of minority languages to support emergent bilingualism. Original findings were presented in three illustrative case studies to answer the overarching research question: How do linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? This research of LL in educational settings was set within a unique context. The novel conceptual framework and methodological approach were effective and findings support pedagogical approaches mediated by the LL and VLL that can mobilise emergent bilingual young children's entire linguistic repertoires in their educational settings and beyond. To conclude this thesis, this chapter first revisits the research problem of ensuring sustained bilingual language development for emergent bilingual young children growing up in Aotearoa New Zealand before identifying the main contributions of this thesis. Research limitations are identified before, and recommendations offered for LL design, policy, theory and future research.

Bilingual Language Development for Emergent Bilingual Young Children Growing up in Aotearoa New Zealand

What is the problem for emergent bilingual young children growing up in Aotearoa New Zealand? Linguistic diversity in Aotearoa has been increasing over recent years and the country is regarded as linguistically "super diverse" (Royal Society of New Zealand, 2013) with over 40 percent of children at the age of two exposed to more than one language (Morton et al., 2014). In 2013, the most common languages in New Zealand were English (96.1%), Māori (3.7%), Samoan (2.2%), Hindi (1.7%), Northern Chinese, including Mandarin (1.3%) and French (1.2%). Based on The United Nations Convention of Children's Rights, all children have the right to the presence and use of their languages both in their physical and virtual landscapes (Articles 29c, Article 30 and Article 17d). In addition to children's rights, this study addresses the research problem specific to the Aotearoa New Zealand context, where there

is concern over low rates of intergenerational transmission of Māori and Samoan (King & Cunningham, 2017) with a significant drop in transmission when children transition to primary schools (Tagoilelagi-Leota et al., 2005). These early years are a time for rapid language acquisition and early oral language skills are influential on children's future academic achievement (e.g., Morrison et al., 2005; Miller et al., 2006). Contrary to some common misconceptions, the development of the minority languages can support an emergent bilingual's acquisition of the majority language (Blom & Bosma, 2016; Cummins, 2000; Mitits et al., 2018; Petitto &Dunbar, 2014; Pham & Tipton, 2018). In Aotearoa New Zealand, there is currently no official language policy; however, there is a statement on language policy provided by the Human Rights Commission (2008) to protect and promote language diversity in Aotearoa New Zealand. Cenoz and Gorter (2006) argue the strength of language visibility and strength of language policy are interconnected, with strong language policy able to protect minority language. However, currently there has been very little LL research to understand if the absence of strong language policy compromises the visibility of minority languages within educational settings. Therefore, the in-depth illustrative case studies of the educational settings in this thesis adds original contributions to the current body of knowledge on LL in educational settings at an important stage in the development of bilingual children's languages.

This thesis confirms the current literature in the field of LL and LL research in educational settings. The LL of the emergent bilingual 4 to 6-year-olds in the three case studies indicated the power, influence and use of languages by majority and minority groups within the educational setting, which were aligned with national curriculum documents and policies (or lack thereof). This confirms existing knowledge on the influence of policy on LL (see for example, Gorter, 2006; Shohamy & Gorter, 2008). Educational settings in this study were guided by the Ministry of Education curriculum documents, Te Whāriki Early Childhood Curriculum (Ministry of Education, 2017) and the New Zealand Curriculum (Ministry of Education, 2007). Both ECE settings (mainstream and Samoan immersion) used additional Ministry of Education documents to support a more culturally responsive learning programme (Ministry of Education, 2011). The bicultural commitments as set out in the *Te Tiriti o Waitangi* [Treaty of Waitangi] underpin the responsibilities for educational settings to support Māori language revitalisation efforts; Māori have experienced language loss and efforts are concentrated on Māori language revitalisation, particularly in early years education (Spolsky, 1989). The LL of all educational settings was inclusive of children's minority languages and particularly rich with Māori language in the ECE centres, with varying degrees of visibility, diversity and complexity. Visibility of languages other than the majority language (English in mainstream and Samoan in immersion) and Māori was mostly similar to the ethnic composition of the children. The LL mediated the teachers' use of minority

languages with children within the educational settings (Figure 7.1). However, it is less clear what policies underpin responsibilities for early years education to support children with their bilingual language development in languages other than Māori. A review of early learning education services in Aotearoa New Zealand identified a need for learning services to support children's oral language and development by "capitalising on 'home languages' as a foundation for other language learning" (Education Review Office, 2017, p. 3). Cummins (2000) also supports this perspective that L1 is foundational for the development of L2, therefore this is a strong argument for continuation of minority languages in educational settings. In addition, bilingualism has cognitive advantages (DeLuca et al., 2019; Singh et al., 2018) along with lifelong benefits (King et al., 2017). As well, bilingualism enables intergenerational and extra-familial interactions and connection that have cultural advantages (Taylor et al., 2008). These contribute to a child's wellbeing outcomes (Bialystok, 2017; Bialystok et al., 2007) and future academic achievement (e.g., Morrison et al., 2005; Miller et al., 2006). Therefore, to ensure more equitable outcomes for all minority language speaking emergent bilingual young children, educational settings should support the presence and use of minority languages for children's mobilisation of their entire linguistic repertoires for holistic development.

This thesis contributes to the current body of knowledge on LL in educational settings by illustrating the LL of educational settings within the context of Aotearoa New Zealand. The educational settings, a mainstream primary classroom studio, a mainstream ECC, and a Samoan immersion ECC, were those attended by ethnically diverse 4 to 6-year-olds in an area of the city with higher numbers of families with languages other than English, with a higher percentage of Māori and Pasifika peoples. Teachers in these educational settings described the ethnic compositions of the children as Māori, Samoan, Tongan, Filipino, Asian, Indian, Persian, Nepalese, South African, Cook Island Māori and Fijian. There was high visibility of Samoan language the immersion ECE, strong visibility of Māori and moderate visibility of other minority languages in the mainstream ECE and low visibility of minority languages in the primary classroom studio. Given that, talk exposure is the underlying mechanism for bilingual language development (Rydland et al., 2014); the presence and use of minority languages can contribute to bilingual language development. However, in the two mainstream case studies, educators were predominantly monolingual speakers and did not have the minority language resources in order to support the presence and use of minority languages within the educational settings. In contrast, the Samoan immersion educational setting was predominantly Samoan speaking and the presence and use of Samoan language was rich, whilst recognising Aotearoa New Zealand's bi-cultural responsibilities within a multicultural present. This indicated that emergent bilingual young

children with minority languages might not be sufficiently supported to develop their minority languages within the mainstream educational setting.

The main contribution of this thesis is the application of Bioecological Systems Framework as a conceptual framework, particularly the *Process-Person-Context-Time* (PPCT) model. The application of the conceptual framework is a novel conceptual approach in LL research. The PPCT model provided more holistic illustration of the microsystem and mesosystem to understand the proximal processes associated to the LL as a mediational mechanism to support the presence and use of minority languages in educational settings. An original finding was that educators continually worked to design the LL as a mechanism to mediate the development of relationships, particularly with caregivers (Figure 7.2), an ongoing process that not only developed over time but also changed with the children attending. These relationships enabled engagement and collaboration that empowered caregivers in bidirectional proximal processes that enriched the LL (physical and virtual) for the emergent bilingual child (Figure7.3). There was evidence from this research that LL artefacts (for example, Figure 6a.19), co-constructed with families and inclusive of children's linguistic and ethnic diversities, mediated the proximal processes between teachers and caregivers, younger and older children, to empower the presence and use of multiple minority languages within the educational setting. Through the proximal processes mediated by the LL, relationships, ethnic identities and minority language were networked. In addition, the display provided a physical space in which ongoing proximal processes could build in complexity.

Although the minority language practices mediated by the LL may have been considered by some teachers in their interviews as minimal, particularly by the mainstream primary classroom teachers, in Bronfenbrenner's terms they can be considered as proximal processes that are drivers of development, particularly if these processes are ongoing and develop in complexity over time. So, put simply, even just a little exposure each day counts. However, not all LL were inclusive of children's entire linguistic repertoires nor diverse cultural identities, indicating limitations on children's mobilising their entire linguistic repertoires within the educational settings. A networked conceptualisation of the LL within the educational setting in this thesis revealed that the LL mediated the development of relationships, networking with whānau and community, and empowerment of teachers, caregivers and young children to support **bidirectional** proximal processes for development.

Another important contribution was the incorporation of the virtual environment associated with the educational setting in the study of the LL. All three educational settings in this thesis had associated

VLL that was inclusive of minority languages. Though the VLL was not observed to mediate interactions directly with emergent bilingual young children, it was a central component of the LL that networked the microsystems by mediating mesosystem interactions between educators and caregivers. There were a number of limitations for educational settings to utilise DT to enhance the LL of educational settings with children's minority languages. This included educators taking a protective approach towards DT use, educators indicating a need for professional development to ensure DT use was purposeful and had educational value, to internet accessibility issues. A notable variation was how DT was used more freely within the home environment compared to the educational setting, with a limited transference of children's virtual experiences, and the possible inclusion of their minority language(s) in the VLL, between each microsystem. The VLL and platforms that enabled bidirectional mesosystem interactions showed potential to bridge the digital divide and network microsystems, thus supporting more visibility and transference of emergent bilingual young children's LL (physical and virtual) across settings.

However, there was little evidence that the LL and/or VLL, associated with the three educational settings in this thesis, mediated translanguaging pedagogy and/or translanguaging practices. Translanguaging pedagogies empower the mobilisation of children's linguistic repertoires (Cenoz & Gorter, 2017; Kirsch, 2018) and fit with Doolittle's (2004) Complex-Constructivism learning principles through building on children's existing internal models. There were some examples within each educational setting that could be considered as translanguaging pedagogies, in that they provided a mediational object or conversational partner in which young children could draw on their linguistic resources. Mediational objects, symbols or people within the LL of emergent bilinguals can support translanguaging as an everyday practice (Krompák & Meyer, 2018). However, much of the LL design and thus the pedagogical approaches inclusive of children's minority languages appeared to be controlled by the teachers, and subsequently their practices were limited to within the educators' linguistic capabilities. Translanguaging pedagogies may mobilise a child's linguistic repertoire with less dependence on educator's language capabilities in the child's minority language(s).

The limitations on pedagogical approaches also appeared to apply to the *digital technology* (DT) mediated pedagogy within the educational settings, with use limited to what was deemed "educational value" by some educators. This contrasted with how caregivers reported their children's DT use within the home, which was driven by children's interests and thus enabled learner agency. DT use within the home environment has potential to expand children's linguistic repertoires (McPake et al., 2013) when young children engage in communicative and creative tasks. However, there was

limited evidence from the in-depth illustrative case studies that indicated children engaged with DT in ways that were inclusive of minority languages other than viewing television shows for children, such as cartoons, with either Māori or Chinese Mandarin. For the Chinese family in this study, DT facilitated socially contingent interactions with family and friends in China, which is recognised as a potential supporter for minority language development (Roseberry et al., 2014). Therefore, DT use to support the presence and use of minority languages seemed limited within children's home and educational setting, despite the immersion setting seeing potential to enable digital equity for their children. This indicated a need to increase pedagogical alignment between the physical and virtual environments of young children, and for educators to understand children are, what Biró, (2018) refers to as, members of the virtual world, which means, "*being networked* and *being in the network"* (Biró, 2018, p. 183). This thesis highlights the need for such networks to be inclusive of children's minority languages. Bringing visibility of the child's virtual membership into LL of the educational settings may serve to align these worlds and reflect children's realities holistically and thus begin to align appropriate pedagogical approaches to support the development of children's bilingualism through their networks.

This thesis offers an original networked conceptualisation for positioning DT within the Bioecological Systems Framework with networked proximal processes. This networked conceptualisation is an original discovery and adds to the theoretical contribution of this thesis. Proximal processes mediated by the VLL networked people and microsystems (Figure 7.5). The VLL enabled teachers to network the educational setting with the home environment using online platforms, supporting potential bidirectional interactions between teachers, caregivers and children. From the evidence in all cases caregiver empowerment to participate in digitally mediated interactions was limited, despite teachers indicating it was a mediator of proximal processes inclusive of families' minority languages. Teachers observed little evidence of families interacting by writing on the virtual platforms of the educational settings in minority languages, indicating the educational setting had power over the direction, content and form of proximal processes with the home environment mediated by the VLL. Most teachers saw potential in DT use within the classroom, with interest in e-books, which have shown potential for bilingual language development (see for example, Korat et al., 2014; Hoffman & Paciga, 2014; Smeets & Bus, 2015). However, use of the DT beyond e-books indicated that the educators' pedagogical perspectives of educational outcomes mediated by DT did not align well with their play-based pedagogies that were supported within the physical environment. Digital free-play transfers from virtual to physical contexts (Björk-Willén & Aronsson, 2014) and can enrich children's play opportunities, social and cognitive demands, and play-complexity (Fleer, 2018). However, the VLL

of young emergent bilinguals, and how children mediated their play with DT, was somewhat invisible to the educators and caregivers in all case studies. This was similar to Lusted and Joffe (2018), who found that caregivers might not necessarily engage with children about their experiences mediated by DT. In this thesis, there was a limited observation and illustration of the VLLs of young children, therefore the influence of the VLL on young children's emergent bilingual language development was obscured.

Both educators and caregivers raised concern about DT use displacing the necessary interactions for language development, with the challenges and opportunities of DT also faced by the wider community and further explored by Harris et al. (2017). As language input and language environments are influential on bilingual language development (Krashen, 1977, 1985; Unsworth, 2016), it is possible that the VLL of minority language speaking emergent bilinguals were dominated by majority language, thus potentially displacing the quantity of minority language input that could be achieved through proximal processes mediated by the VLL. However, proximal processes mediated by the VLL were less visible than those mediated by the physical LL therefore there are limitations on identifying the power in directionality in proximal processes mediated by the VLL. It was not clear if the VLL enabled translanguaging through communicative, creative or socially contingent interactions, interactions identified as beneficial for language development (see for example, Teepe et al., 2017; Walter-laager et al., 2016; Skaug et al., 2018) to mobilise children's entire linguistic repertoires.

The study answered the overarching research question: How do linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand? The linguistic landscapes of educational settings support the presence and use of minority languages of emergent bilingual 4 to 6-year-olds in Aotearoa New Zealand through mediating proximal processes. Proximal processes mediated by the LL (physical and virtual) network people and systems to provide a triadic approach that develops over time (Figure 7.6) to support the presence and use of minority languages across contexts. Proximal processes, when balanced in power and directionality, can ensure systematic and extensive exposure to minority languages across the microsystems of emergent bilingual young children that is necessary for sustaining children's bilingualism. Development of the LL and VLL as mediators can influence the presence and use of minority languages in educational settings through empowering caregivers and their networks in the mobilisation of children's entire linguistic repertoires. The findings from this study support co-construction of the LL of educational settings through responsive reciprocal engagement with people within the community they serve, to ensure those children's languages and identities are interwoven.

Thus, designing the linguistic landscape (physical and virtual) of educational settings based on the development of relationships, networks and empowerment, can interweave minority language within the educational settings to support more holistic development of emergent bilingual young children's linguistic repertoires. Even a little incorporation of minority language, for example, the use of multilingual greetings, can go a long way towards strengthening relationships and minority language networks. This ensures a triadic approach, between the linguistic landscapes (physical and virtual), people and their networks to advocate and better support children's sustained bilingual language development as a child's right, a bi-cultural responsibility and a social, emotional and cognitive advantage.

Limitations

There were a range of limitations and methodological constraints associated with this thesis. Firstly, a major limitation was that there was no direct observation of the proximal processes as they occurred directly with, or mediated by, the LL of the educational setting (physical and virtual). I was mindful that the methodological design did not burden the educators or other potential participants with any form of extensive or ongoing observation, particularly any direct observation of children. Therefore, data collection was limited to direct observation of the LL and publicly accessible VLL associated with the educational setting. Incorporating the VLL into the LL research of the educational settings was considered an important contribution to the methodological design for LL research in this thesis. However, there was limited access to the VLL shared between teachers and caregivers. This included highly relevant VLL of children, for example, children's e-portfolios and VLL on the DT accessible to young children in the educational setting. There was no systematic approach to gathering data from the VLL of publicly accessible content online associated to the educational settings, as there were extensive links and pathways on the websites of schools and organisations. Therefore, observation of the VLL was limited due to the complexity of the VLL and so the methodological design opted for a more practical capturing of the VLL through the interpretations and experiences of the VLL supplemented with screenshots from undertaking a general search online of the educational setting.

Due to the less systematic approach to the VLL, a count of languages visible in the VLL was not included into the VLL analysis. Proximal processes and private VLL communications were limited to educator and caregiver descriptions and perceptions only. In addition, no access to the home environment was

requested, the LL of home was based on caregiver's recall of the home LL, which had a number of obvious limitations, one of which was relying on their interpretation as to what represented the LL. However, it is likely that more language would be visible within the home than that recalled by caregivers, such as on food packaging, books, instruction manuals, clothing tags for example. Therefore, the caregiver's accounts of there being very little language visible within the home environment could be interpreted to mean that there was not intentional display of languages within the environment. Direct observation may have uncovered more visibility of languages within the home environment but would have required further ethical considerations given that the home environment is a private and personal space. Possibly it would be more useful in future research to elicit descriptions of the LL of the home environment by asking caregivers to complete a form that guided a walk through their home, a possible adaptation of Szabó's (2015) "tourist guide technique" (p. 27) so that their descriptions of the LL of the home environment could have been constructed within the home environment. The conversational nature of the interviews conducted within the educational setting reduced the opportunity for all aspects of the language environment to be addressed consistently across the participant interviews. However, an advantage for the conversational nature was that it enabled participants to express aspects important to them, as well as positioning them with the power to ensure their own privacy and enable researcher sensitivity to the cues given by the participant during the interview as a guide as to whether further questioning was invited or not.

Secondly, there were a number of timeline limitations despite the period of long engagement with participants, who were also involved in A Better Start and Study Two (Gillon et al., 2019). Time was spent maintaining these relationships through the A Better Start project workshops, community engagement and continuing research after data collection was complete. However, as a result it was difficult to recruit primary schools, as they were less responsive to the initial email request. Therefore, there were fewer primary schools than early childhood centres to draw on for case studies and there was not enough time to build relationships with participants prior to collecting data. In addition, due to limited prior knowledge of the educational setting, important artefacts were unable to be identified prior to data collection and interviews. Although identification of these artefacts emerged from the interview, this did not appear to limit the research. The time of year also dictated the availability for teachers and caregivers to participate and the end of year was a busy time; therefore, recruitment of caregivers was particularly difficult. The collection of data only occurred over two points in time, so did not capture the slow changing elements within the LL.

Recommendations

The purpose of the recommendations is to support policy-makers, researchers, teachers, caregivers and their community networks to develop their LL as a mechanism to stimulate daily interactions that increase in complexity and, in particular, for this to continue to build on bilingual children's developing bilingualism after they transition from ECE to primary school. The LL (physical and virtual) of educational settings is an effective mechanism for the development of relationships to mediate proximal processes that support the presence and use of minority languages within and beyond the educational setting for the development of young children's emergent bilingualism including English literacy and language. The application of the Bioecological Systems Framework as a conceptual framework in this research has aided understanding of how proximal processes, mediated by the LL, can support to increase the presence and use of minority languages within the educational settings of emergent bilingual young children over time. The ongoing, bidirectional nature of proximal processes that increase in complexity and empowerment for development, give rise to a number of recommendations for LL design, policy, theory and future research in order to enhance proximal processes, social relationships and mesosystem networks and interactions. These recommendations are presented below starting with LL design.

Linguistic Landscape Design

While these recommendations are largely written for an audience in Aotearoa New Zealand, many of them are also applicable to other countries. It is recommended that, in relation to the design of educational LL (physical and virtual) for 4 to 6 -year-old emergent bilinguals,

- **all** children in Aotearoa New Zealand are identified as emergent bilinguals with linguistic repertoires in both English and Māori in addition to any other languages spoken by their whānau.
- all educators and whānau to become aware of the LL of their educational settings.
- both physical and virtual aspects of the LL of educational settings are included.
- LL awareness is supported with regular LL review reflective practice in order to develop a strong position on language policy and the development of bilingualism.

- educators support the networking of microsystems across time and space, including strengthening continuity from ECE to primary school to ensure increasing complexity of proximal processes for minority language development.
- all minority languages of emergent bilingual young children are represented within their LL, particularly in LL of educational settings.
- profile photos and people's names in the LL of the educational settings are recognised to be part of the LL and to contribute to building a sense of identity, belonging and inclusion.
- it is recognised that the LL (physical and virtual) is a mechanism that influences language perception and use, and a generator of culture through the daily interactions mediated by the LL. It is recognised that LL development is based on processes that align with bilingual language development theory.
- LL is designed to invite bidirectional interaction (direct and mediated) and mobilises children's language resources and translanguaging.
- LL is designed to support the development of emergent bilingual children's language networks.
- educators and caregivers seek additional people as support, particularly those with minority language resources for LL development and related proximal processes within the educational setting.
- LL is designed to invite collaboration, participation and partnership with children and family, sharing power in the development of minority language resources, relationships and community networks.
- children and their families are empowered to have ongoing agency in the development of the LL of educational settings.
- LL is designed to create safe spaces for minority language speakers, such as those that create a sense of identity, belonging, whānau and community.
- LL is considered as multisensory, such as natural lighting, natural materials, background radio and music, that contribute to the ambient stimulation of the LL.
- improvements in LL design aim to achieve low levels of ambient stimulation that support proximal processes. Displays within the LL can be minimal and developed over time to create a sense of identity, belonging, whānau and community.
- LL is designed to bridge microsystems, thus inclusion of minority languages influences the perceived value and use of minority languages across microsystems.

- educators support whānau to enrich the LL (physical and virtual) of the home environment with their minority language(s), such as sending home children's published art and writing inclusive of their minority language(s).

Policy

Based on the findings from this thesis, the LL of the three educational settings aligned with their associated curriculum documents regarding the presence and use of minority languages within the educational settings. Therefore, there are two main recommendations for future policy development. Firstly, all educational settings need to create and maintain a language policy. No educational setting in this thesis had a specific language policy, much less a policy based on a sound understanding of bilingual language development. Secondly, it is recommended that developers of curriculum interweave biculturalism and multiculturalism to position all children as emergent bilinguals, and aim to counter deficit discourses in order for the curriculum to increase promotion of equitable outcomes.

In addition, the following recommendations aim to support the development of language policy.

- All educational institutions, including ECE services and schools, are recommended to create a specific language policy that encourages and supports children's sustained bilingualism because strong language policy tends to protect minority languages (Cenoz & Gorter, 2006).
- Update the policy as part of the annual review using evidence gathered from the LL (physical and virtual) of the educational settings.
- Use LL case studies in professional development, such as those undertaken in Study Three (Gillon et al., 2019), and establish a community network for LL (physical and virtual) development.
- Policy-makers and educators are recommended to engage in professional development to support their understanding of bilingual children's complex language use to enhance children's minority language use within educational settings through translanguaging pedagogies (see for example, Cenoz & Gorter, 2017; Kirsch, 2018; Otheguy et al., 2015).
- Educators are recommended to acknowledge children's entire linguistic repertoires and community language networks in enrolment procedures.
- Educational institutions are recommended to network with national and community organisations that support cultural and linguistic diversity.

The lack of microsystem policy in the three case studies may be reflective of the lack of national language policy in Aotearoa New Zealand. Therefore, in addition, it is strongly recommended that a national language policy be developed based on the principle of partnership to ensure visibility of minority languages is embedded throughout all manifestations of the policy document. Considering the gaps between the language policy principles and meaningful implementation through effective practice (May, 2015), the consideration and incorporation of LL in the development of language policy could provide a bidirectional mechanism between policy principles and practice. The LL could enable the policy-makers to influence educators and thus, the educators and their communities to influence policy-makers.

Theory and Future Research

The Bioecological Systems Framework as a conceptual framework is recommended for future LL research to structure the necessary holistic view and related research design to provide a theoretical approach that is multidisciplinary, multi-contextual, and capable of revealing the micro interactions that can be viewed as generators of culture. The application of the Bioecological Systems Framework, particularly the PPCT model, in this thesis to illustrate the LL of educational settings enabled a more holistic illustration of the LL of emergent bilingual 4 to 6-year-olds, including changes over time. Its application in this study has demonstrated a more detailed conceptualisation of the Bioecological Framework, outlined in Chapter two in this thesis, in order to position the elements of the PPCT model, particularly the relationships between the people, objects and symbols within the child's microsystems of the home environment and the educational setting. It is therefore recommended that a networked conceptualisation of proximal processes and systems (as described in Figure 7.4 and 7.5), inform future application of the Bioecological Systems Framework. In addition, it is recommended that the PPCT model be applied to different educational contexts, both nationally and internationally, to strengthen the validity of the conceptual framework in LL research to build on the findings in this thesis and further develop the body of knowledge of LL in educational settings for bilingual language development.

The overarching methodological approach of this thesis was qualitative, guided by ethnography principles (Mills and Morton, 2013) from an educational perspective to provide a more nuanced understanding and build on previous studies. More importantly, indigenous ethical considerations guided a culturally responsive methodology to ensure equitable power and outcomes for participants.

These ethical considerations were observed through the application of Kaupapa Māori practices (described in the Kaupapa Māori informed practices section of the Methodology chapter of this thesis). Kaupapa Māori informed practices (Smith, 1999) aimed to build safe, trusting and ongoing relationships and reciprocal engagement with participants to build trustworthiness and validity of the research. The prioritisation of relationship strengthened the cultural alignment of this study, as the principle of relationship also underpinned the *Fausiga o le Faletele* Samoan cultural framework and values (Figure 6c.2). This relationship principle, enacted through the Kaupapa Māori informed practices, served to guide researcher engagement and reciprocity within the bi/multicultural contexts. Therefore, it is recommended that researchers in culturally diverse contexts adopt a Relational Perspective, with reciprocity as an indigenous theme, to support a culturally responsive methodology.

Data collection included the use of digital photos, videos, screenshots of VLL, semi-structured interviews with caregivers and educators in two phases of data collection. It is recommended that future research take into account children's physical and virtual realities as locations in which children develop, thus the definition of LL include both the physical and virtual environments. In the three case studies, caregivers and teachers gave limited descriptions of children's VLL, indicating a need to explore new ways of understanding children's virtual environments and the inclusion of minority languages within their VLLs. Future definitions of the LL could shift from geographically defined settings, to one based on exploring the experiences of the developing person. Such a definition could create a more holistic understanding of the LL and how the LL is networked through social interactions across multiple microsystems, thus the VLL then becomes an equally considered element of the LL. A recommendation for future research is to incorporate more data collection methods in order to capture the experiences of the LL (physical and virtual) from the perspective of the developing person. For example, direct observations of children's interactions with VLL across settings.

The development of children's minority language(s) is critical in early years education for their sustained bilingualism, particularly in the context of majority language societies such as Aotearoa New Zealand with Māori language revitalisation and intergenerational transmission of minority languages. In addition to the social and cognitive benefits associated with bilingualism, the development of children's minority language(s) can influence the development of their subsequent majority language development, as indicated by the research on bilingual language development (Cummins, 2000; Petitto & Dunbar, 2004). A significant influence on children's bilingual language development in these early years is parental attitudes towards bilingual language development (Makarova et al., 2019). The LLs of microsystems prior to children attending educational settings, such as the networked

microsystems of children from birth to 6 years, could provide evidence to empower families to prioritise the development of minority languages, for example, the LLs of other microsystem environments such as the community library, church, playgrounds and health care organisations. Incorporating additional microsystems in future LL research could provide a broader view on the LL (physical and virtual) that support the presence and use of minority languages earlier in young children's development to influence and empower caregivers to continue to advocate for their children's emergent bilingual language development. Thus, it is recommended that future research on the LL of young emergent bilingual children include gathering LL of community settings in which children develop over time, including influential environments prior to attending educational settings.

Closing Note

My role as Lead Research Assistant to Emergent Bilinguals in a Digital World (https://ebdwwebsite.wixsite.com/ebdw) began alongside my Master's thesis research of a Māori ECC (Harris, 2017), and effectively ends with submission of this PhD thesis. In the introductory chapter, I argued that it is necessary for educational settings to find mechanisms to support the presence and use of minority languages to ensure opportunities for emergent bilingual young children from minority cultures to have the lifelong benefits of bilingualism whilst growing up in majority language societies. My journey as Lead Research Assistant to the National Science Challenges E Tipu E Rea strand of research called Emergent Bilinguals in a Digital World, has provided successful workshops with that goal in mind and this thesis consolidates that *mahi* [work] with theoretical and methodological findings as well as three rich case studies.

Throughout this journey, it is perhaps an understatement to say that my awareness of the linguistic landscapes around me has grown. I have observed the changing linguistic landscapes (physical and virtual), both in the educational settings in this thesis and their associated communities, of which I am a member. Each year for example, celebrating Māori language week has increased the use of Māori language throughout our communities and in digital screen media, so that seeing and hearing Māori language has become more normalised and this is likely to continue to increase. When I first began my research, the contrasts between the educational settings and their community settings were stark. The educational settings, particularly the ECE, were rich with Māori language presence and use and minority languages had visible status and value with multilingual greetings. When I moved out of those educational settings, the LL of the communities appeared barren, dominated with English and little to no visibility of minority languages. With such contrast, it struck me how the educators in these educational settings are leaders driving change. National organisations, institutions, commercial industries, and local communities could benefit by looking at these early years educational settings as illustrations of what it means to live in Aotearoa New Zealand with our bicultural responsibilities and multicultural present (Ministry of Education, 2017).

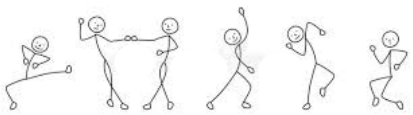
This thesis has provided a new insight in the field of LL and educational research by illustrating the relationship between the microsystems of young emergent bilingual 4 to 6-year-olds and interactions between their teachers and caregivers that support the presence and use of minority languages within their educational settings. These results can be taken into account when considering how to design and develop the LL and VLL of emergent bilingual young children. Through the wider Better Start

programme of research the in-depth illustrative case studies of the LL of educational settings have already contributed to a deeper understanding of the processes and underlying relationships that influence the development of LLs in these and other educational settings.

In concluding this thesis, I would like to emphasise that while previous research had focused on mostly the number of languages visible within physically defined settings, this qualitative ethnographic study illustrates ways in which the LL can mediate proximal processes that can vary in power, direction, form and content. Proximal processes associated to LL involve direction and power, so future LL design should empower minority languages in bidirectional interactions that increase in complexity (both depth and breadth) to support minority language development. Enriching the LL of educational settings can mediate the development of relationships, empowerment of caregivers, and networking of contexts to develop the presence and use of minority languages in the settings over time, thus ensuring emergent bilingual 4 to 6-year-olds are not underserved within and beyond their educational settings. Supporting the sustained bilingual language development of emergent bilingual young children through empowering caregivers and enriching linguistic landscapes can influence children's future academic achievement and contribute to ensuring equitable well-being outcomes.

Ngā mihi nui, faafetai tele lava, 多謝。

El fin



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Appendices

Appendix 1 – Guiding Interview Questions

Teachers

- What are your language practices in the educational setting?
- What do you do to encourage the development of minority languages?
- How do you use technology in the educational setting?
- What is the policy on digital technology use?
- How do you interact with home?

Family/whānau

- What language do you have visible in your home?
- What are your language practices at home?
- What do you do to encourage development of minority language?
- How do you use technology at home?
- When would you encourage or discourage technology use?
- How do you interact with the educational setting?

The Head Teacher

- What language practices does the educational setting have?
- What digital technology does the educational setting use?
- What are your language and digital technology policies?
- How do the environments of the home and the educational setting connect?

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30 May 2018

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

A study of the linguistic landscape of an early childhood centre

Information Sheet for Head of Centre

I am a research assistant for A Better Start: E Tipu E Rea at the University of Canterbury, http://www.abetterstart.nz/en.html, researching emergent bilinguals and digital technology to improve learning success. I am interested in the linguistic landscape your classroom, your language and digital technology policies and practices, and the interaction between the classroom, home and community. The purpose of the study is to share examples of good practice as a resource to support emergent bilinguals in a digital world.

I would like to invite you and your school to participate in my present study. If you agree to take part in the study I will;

- Capture the linguistic landscape by taking a video recording of the walls around the circumference of the classroom and photos of the displays. The video recording will include audio and will capture the ambient soundscape of the classroom.
- Search, describe and take possible screenshots of the online environment of the centre.
- Aim to interview one head teacher, two teachers and two whānau about language and digital technology policies and practices.
- Create a digital resource of the linguistic landscape.
- Present back your linguistic landscape in a feedback session, explain the various publication permissions and consent forms, and explore additional tools to support emergent bilinguals in a digital world.
- Revisit the classroom after one year to capture the linguistic landscape through video and photos and interview the head teacher about the changes in the linguistic landscape.

If you agree to take part in the study you will be asked to;

- Participate in an interview for no longer than one-hour at your school at your convenience either as an individual or as a part of your teaching team.

- Participate in a feedback session that will be no longer than one-hour, where I will present back your linguistic landscape as a resource and explore additional tools to support emergent bilinguals in a digital world.
- Participate in an interview, approximately one year after the initial interview, for no longer than one-hour at your school at your convenience when I return to recapture the linguistic landscape.

The interview will mostly be about;

- Your language use in the classroom.
- The digital technology you see, hear and that is used in your classroom.
- How you encourage language development.
- How you use technology with children.
- Your language and digital technology policies.
- Your thoughts about the interaction between the centre and home, and through technology that support emerging bilinguals.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will do my best to remove all of the information relating to you from the project, including any final publication, provided that this remains practically achievable.

The results of the project may be published, adapted and created into a digital resource, reported internationally at conferences and in educational journals. Any digital resource material based on data gathered from your school will not be published unless an additional consent is given. This consent will contain various publication permissions and will occur after seeing and discussing the digital resource.

It is possible the description of the school may make the school identifiable and/or the school may wish to be publicly identified. No identifiable audio or interview data gathered in this investigation will be published: your identity will not be made public without your prior consent. To ensure confidentiality, pseudonyms will be used, comments will not be attributed, and identifying details will be mixed so that no comments can be traced back to any individual. It is likely that people within the school will know who has participated, as the interviews are planned to be held at the school. You will be able to review your interview transcripts to check that you are comfortable with what you have said.

You, along with the researcher, advisors and research supervisors, will be the only people to see your interview and audio data. No data will be published or reused by the school. All data will be securely

stored on the password protected UC secure server for 10 years following the study. It will then be deleted. A thesis is a public document and will be available through the UC Library.

As this research is of relevance to communities, consultation and support from advisors from the University of Canterbury will be integral to this research to ensure that the research remains robust, transparent and responsive to the participating community. Any details of this research discussed during consultation will remain confidential.

All participants will be consulted during the research stages of data gathering and analysis. At the end of the study, in a meeting with kai hosted by the researcher, participants will receive a report on the study and be presented the findings. If you have any questions about the study, please contact me (details above). If you have a complaint about the study, you may contact

The Chair
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If you agree to participate in this study, please complete the attached consent form to be collected from the centre prior to your scheduled interview.

Thank you

Leona Harris

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A study of the linguistic landscape of an early childhood centre

Information Sheet for Teachers

I am a research assistant for A Better Start: E Tipu E Rea at the University of Canterbury. I am also College of Education PhD student. I am interested in the language environment your early childhood centre so it can be described as an example of good practice. The study will investigate links between the language environment of the early childhood centre, the home and the use of technology.

I would like to invite you to participate in my present study. If you agree to take part in the study, you will be asked to;

- Have 2x10 minute audio recordings made of your speaking during everyday activities at the centre.
- Participate in an interview for no longer than one-hour at the centre at your convenience.
- Engage in casual conversations that would total no more than one hour over two weeks.

The interview will mostly be about;

- Your language use at your centre.
- The digital technology you see, hear and that is used at your centre.
- How you encourage language development.
- How you use technology with children.
- Your thoughts about the language interaction between the centre and home, and through technology.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will do my best to remove all of the information relating to you from the project, including any final publication, provided that this remains practically achievable.

The results of the project may be published, reported internationally at conferences and in educational journals. It is possible the description of the centre may make the centre identifiable and/or the centre may wish to be publicly identified. No audio or interview data gathered in this investigation will be published: your identity will not be made public without your prior consent. To ensure confidentiality, pseudonyms will be used, comments will not be attributed, and identifying details will be mixed so that no comments can be traced back to any individual. It is likely that people within the centre will know who has participated, as the interviews are planned to be held at

the centre. You will be able to review your interview transcripts to check that you are comfortable with what you have said.

You, along with the researcher, advisors and research supervisors, will be the only people to see your interview and audio data. No data will be published or reused by the centre. All data will be securely stored on the password protected UC secure server for 10 years following the study. It will then be deleted. A thesis is a public document and will be available through the UC Library.

As this research is of relevance to communities, consultation and support from advisors from the University of Canterbury will be integral to this research to ensure that the research remains robust, transparent and responsive to the participating community. Any details of this research discussed during consultation will remain confidential.

All participants will be consulted during the research stages of data gathering and analysis. At the end of the study, in a meeting with kai hosted by the researcher, participants will receive a report on the study and be presented the findings. If you have any questions about the study, please contact me (details above). If you have a complaint about the study, you may contact

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CHRISTCHURCH NEW ZEALAND

A study of the linguistic landscape of an early childhood centre

Information Sheet for Parents/Caregivers

I am a research assistant for A Better Start: E Tipu E Rea at the University of Canterbury. I am also a College of Education PhD student. I am interested in the language environment of your early childhood centre to describe an example of good practice in supporting children's language development. The study will investigate links between the language environment of the early childhood centre, the home and the use of technology.

I would like to invite you to participate in my present study. If you agree to take part in the study, you will be asked to

- Participate in an interview that will be no longer than one-hour and held at the centre at your convenience.

The interview will mostly be about;

- The languages displayed around your home.
- The languages heard at home.
- The technology at home.
- How you encourage language development at home.
- How you and your child use technology with children.
- How you see the language interaction between home and the centre, including through technology.

Participation is voluntary and you have the right to withdraw from the project at any time without penalty. If you choose to withdraw, I will do my best to remove all of the information relating to you from the project, including any final publication, provided that this remains practically achievable.

The results of the project may be published, reported internationally at conferences and in educational journals. It is possible the description of the centre may make the centre identifiable and/or the centre may wish to be publicly identified. No audio or interview data gathered in this investigation will be published: your identity will not be made public without your prior consent. To ensure confidentiality, pseudonyms will be used, comments will not be attributed, and identifying details will be mixed so that no comments can be traced back to any individual. It is likely that people within the centre will know who has participated, as the interviews are planned to be held at

the centre. You will be able to review your interview transcripts to check that you are comfortable with what you have said.

You, along with the researcher and research supervisors, will be the only person to see your interview data, which you will have the opportunity to review. All data will be securely stored on the password protected UC secure server for 10 years following the study. It will then be deleted. A thesis is a public document and will be available through the UC Library.

As this research is of relevance to communities, consultation with advisors from the University of Canterbury will be integral to this research to ensure that the research remains robust, transparent and responsive to the participating community. Any details of this research discussed during consultation will remain confidential.

All participants will be consulted during the research stages of data gathering and analysis. At the end of the study, in a meeting with kai hosted by the researcher, participants will receive a report on the study and be presented the findings. At any stage, the information about this study will be available.

If you have any questions about the study, please contact me (details above). If you have a complaint about the study, you may contact

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If you agree to participate in this study, please complete the attached consent form and return it to the centre prior to your interview.

Thank you

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CHRISTCHURCH NEW ZEALAND

A study of the linguistic landscape of an early childhood centre

Consent Form for Head of Centre

- I have been given a full explanation of this project and have had the opportunity to ask questions.
- I understand what is required of my centre and me if I agree to take part in the research.
- I understand that participation is voluntary and I may withdraw my centre or myself at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- I understand that any information or opinions I provide will be kept confidential to the researcher and research supervisors and that any published or reported results will not identify the participants or location. I understand that a thesis is a public document and will be available through the UC Library.
- I understand that the centre may be identifiable and that other members of the centre may be aware of my participation in the research.
- I understand that all data will be securely stored on the password protected UC secure server for 10 years following the study. It will then be deleted.
- I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.
- I understand that I can contact the researcher Leona Harris, Leona.harris@canterbury.ac.nz, or supervisors Una Cunningham, una.cunningham@canterbury.ac.nz and Niki Davis, niki.davis@canterbury.ac.nz for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)
- By signing below, I agree to participate in this research project.

Name:_____Signed:_____Date:____

Email Address for report of findings:_____

Please return this completed consent form, to be collected from the centre, prior to your interview.

School of Teacher Education
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30 May 2018

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Consent Form for Teachers

- I have been given a full explanation of this project and have had the opportunity to ask questions.
- I understand what is required of me if I agree to take part in the research.
- I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- I understand that any information or opinions I provide will be kept confidential to the researcher and research supervisors and that any published or reported results will not identify the participant. I understand that a thesis is a public document and will be available through the UC Library.
- I understand that the centre may be identifiable and that other members of the centre may be aware of my participation in the research.
- I understand all data will be securely stored on the password protected UC secure server for 10 years following the study. It will then be deleted.
- I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.
- I understand that I can contact the researcher Leona Harris, Leona.harris@canterbury.ac.nz, or supervisors Una Cunningham, una.cunningham@canterbury.ac.nz and Niki Davis niki.davis@canterbury.ac.nz for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)
- By signing below, I agree to participate in this research project.

Name:_____Signed:_____Date:____

Email Address for report of findings:_____

Please return this completed consent form to the centre prior to your interview.

School of Teacher Education
Telephone:
Email: Leona.harris@canterbury.ac.nz
30 May 2018

UNIVERSITY OF CANTERBURY
Te Whare Wānanga o Waitaha
CHRISTCHURCH NEW ZEALAND

A study of the linguistic landscape of an early childhood centre

Consent Form for Parents/Caregivers

- I have been given a full explanation of this project and have had the opportunity to ask questions.
- I understand what is required of me if I agree to take part in the research.
- I understand that participation is voluntary and I may withdraw at any time without penalty. Withdrawal of participation will also include the withdrawal of any information I have provided should this remain practically achievable.
- I understand that any information or opinions I provide will be kept confidential to the researcher and research supervisors and that any published or reported results will not identify the participants or location. I understand that a thesis is a public document and will be available through the UC Library.
- I understand that the centre may be identifiable and that other members of the centre may be aware of my participation in the research.
- I understand that all data will be securely stored on the password protected UC secure server for 10 years following the study. It will then be deleted.
- I understand that I am able to receive a report on the findings of the study by contacting the researcher at the conclusion of the project.
- I understand that I can contact the researcher Leona Harris, Leona.harris@canterbury.ac.nz, or supervisors Una Cunningham, una.cunningham@canterbury.ac.nz and Niki Davis niki.davis@canterbury.ac.nz for further information. If I have any complaints, I can contact the Chair of the University of Canterbury Educational Research Human Ethics Committee, Private Bag 4800, Christchurch (human-ethics@canterbury.ac.nz)
- By signing below, I agree to participate in this research project.

Name:_____Signed:_____Date:____

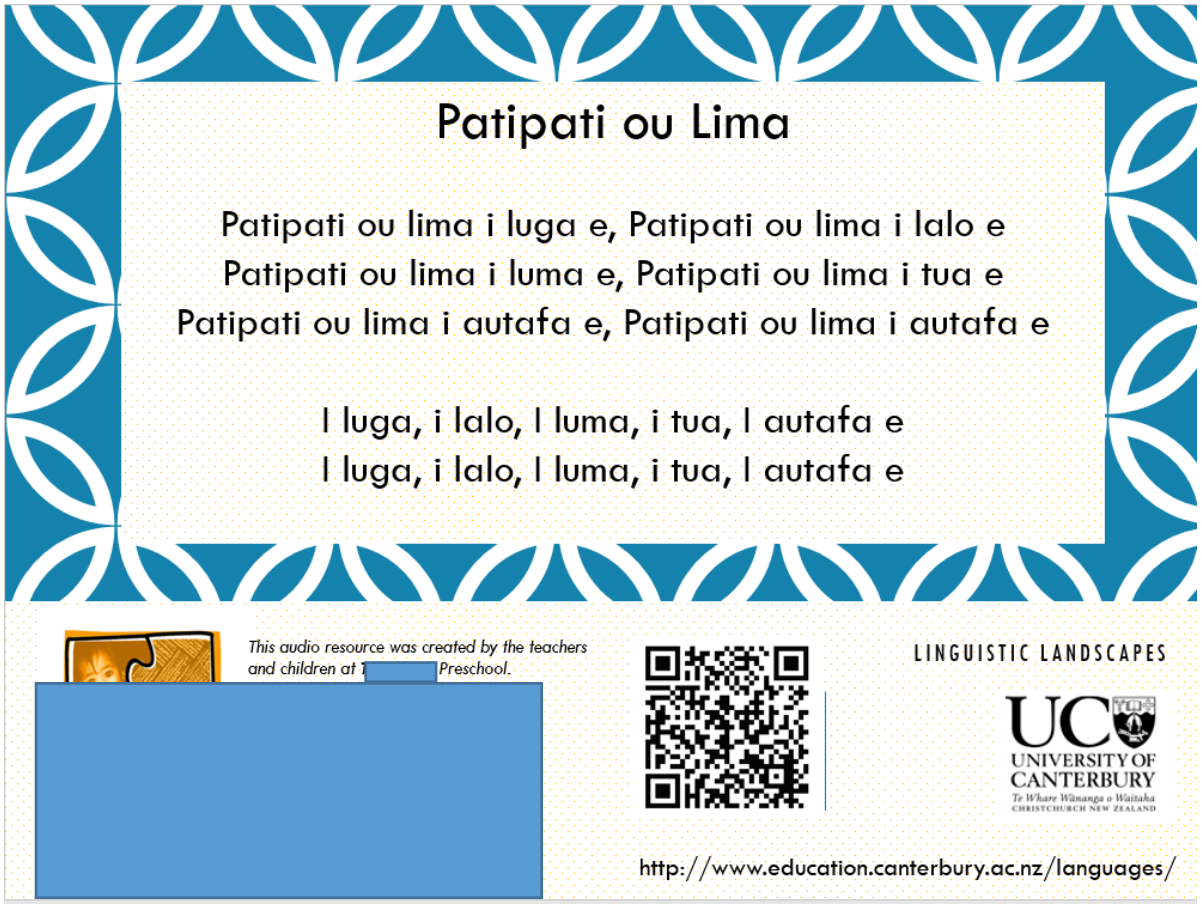
Email Address for report of findings:_____

Contact telephone number – to arrange interview

_____

Please return this completed consent form to the centre prior to your interview.

Appendix 3 – Co-construction of a Samoan language resource with QR code



Appendix 4 – Study Three: Emergent Bilinguals in a Digital World

(A Better Start Literacy and Learning Theme, 2019, p. 8)

Pūtere 3 | Project 3
Emergent Bilinguals in a Digital World

The kaupapa of Project 3 explores the intertwining of emergent bilingual development and the use of digital technologies to support the development of bilingualism in the early years of education. This project has two main strands – the gathering of 'linguistic landscapes' (descriptions of the linguistic environment) in early childhood education (ECE) and primary school settings, and the implementation of workshops to showcase best practice and increase the richness of ECE and school classroom environments to support multilingual children.

Project 3 has contributed significantly to the evolving landscape of knowledge on best practice for fostering emerging bilingualism and multilingualism in the early years. Key findings from the project include:

1. The linguistic landscape of an education space, both in person and online, communicates to tamariki, whānau and the community the relative importance of all the languages and cultures.
2. The presence of signs in educational settings of more than one language, as well as including cultural artefacts prompts and supports the use of multiple languages thus enabling children and adults to engage and build multilingual language and social skills.
3. The digital world can be effectively deployed to strengthen connections between homes and centres to support multilingual language development.
4. Early childhood centres, their families and communities want guidance with strategies that can safely enrich the ecosystems of early childhood (both physical and digital) with all their children's languages.
5. Co-construction of policy and practice (relating to technology and multilingualism) in educational ecosystems is essential, so that emergent bilinguals can have a better start in the digital world.

Project 3 Key Outputs

Cunningham, U. & King, J. (2019). Greening the information desert: Supporting emergent bilinguals with research-informed workshops. ***Australian Review of Applied Linguistics***, *42*(1), 37–58.

Cunningham, U., King, J., Davis, N. E., & Kim, J. (In Preparation). Policy guidance towards a better start for multilingual children in a digital world.

Davis, N. E., Harris, L. & Cunningham, U. (2019). Professional ecologies shaping technology adoption in early childhood education with multilingual children. *British Journal of Educational Technology*, 50(3), 1320-1339. **http://dx.doi.org/10.1111/bjet.12774**

Harris, L., Cunningham, C., King, J., & Stirling, D. (In press). Landscape design for language revitalisation: Linguistic landscape in a Māori immersion early childhood centre. In E. Krompák, V. Fernández-Mallat, & S. Meyer (Eds), *Linguistic landscapes and educational spaces*. Bristol, UK: Multilingual Matters.

Cunningham, U., & King, J. (2018). Language, ethnicity, and belonging for the children of migrants in New Zealand. *SAGE Open*. **https://doi.org/10.1177/2158244018762571**

Harris, L., Davis, N. E., de Vocht, L., Cunningham, U. (2018). Languages seen are languages used. The linguistic landscapes of Early Childhood Centres. *Early Education Journal*, 64, 24-28.

Harris, L., Davis, N. E., Cunningham, U., de Vocht, L., Macfarlane, S., Gregory, N., ... Dobson, J. (2018). Exploring the opportunities and challenges of the digital world for early childhood services with vulnerable children. *International Journal of Environmental Research and Public Health*, 15(11), 2407. **https://doi.org/10.3390/ijerph15112407**

King, J. & Cunningham, U. (2017). Tamariki and fanau: Child speakers of Maori and Samoan in Aotearoa/New Zealand. *Te Reo*, 60, 29-46.

"The digital world can be intentionally deployed to strengthen connections between education and homes for linguistically diverse children, including connections focused on promoting intergenerational language transmission. Teachers, families, stakeholders and policy makers appreciate guidelines and strategies for an environment that best supports young multilingual children."

Distinguished Professor Niki Davis